

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

OSSEO IMAGING, LLC,)
) VOLUME 2
Plaintiff,)
) C.A. No. 17-1386(JFB)
v.)
) ROUGH DRAFT
PLANMECA USA, INC.,)
)
Defendant.)

Tuesday, August 23, 2022
8:34 a.m.
Jury Trial

844 King Street
Wilmington, Delaware

BEFORE: THE HONORABLE JOSEPH F. BATAILLON
United States District Court Judge

APPEARANCES:

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BY: RONALD GOLDEN, ESQ.

-and-

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THE COURT: You may be seated.

All right. So I'm ready only for little issues,
okay. You ready?

MR. CASSONE: Yes, Your Honor.

THE COURT: Who goes first?

MR. FLYNN: Good morning, Your Honor. We have a
few objections to exhibits that they're planning to use with
their damages expert, Mr. Blok, which we expect to be this
afternoon. I could hand up a copy of the exhibit, Your
Honor.THE COURT: If you would. All right. Your
objection, the plaintiff -- your objections to the
plaintiff's exhibit.

MR. FLYNN: Yes, Your Honor. So these are all

08:35:25 1 just summaries of Mr. Blok's testimony from -- that he plans
08:35:30 2 to admit. We're fine with them displaying those summaries
08:35:34 3 as demonstratives, but these are just pages from his report.
08:35:38 4 They were not in evidence.

08:35:43 5 THE COURT: So they were not marked as exhibits
08:35:45 6 is what you're saying?

08:35:47 7 MR. FLYNN: Your Honor, they were marked as
08:35:49 8 exhibits, we objected, just like any other -- just like his
08:35:52 9 expert report, they're summaries of his testimony, they're
08:35:55 10 not documentary evidence.

08:35:58 11 THE COURT: All right. So you would have him
08:36:00 12 get all the original documents and put them into evidence
08:36:04 13 rather than his calculations?

08:36:06 14 MR. FLYNN: That's correct, Your Honor. I mean,
08:36:08 15 this is just a summary -- it's just a summary of his
08:36:13 16 testimony, it's like any other demonstrative, he can walk
08:36:16 17 the jury through and there are other exhibits that we're not
08:36:19 18 objecting to, for example, how they got to the number of
08:36:21 19 accused products, how they got to the average selling price,
08:36:25 20 but, for example, when you get to just, you know, doing the
08:36:32 21 calculations, that's not evidence, that's typically kept
08:36:35 22 out.

08:36:38 23 THE COURT: All right. So what says the
08:36:42 24 plaintiff?

08:36:45 25 MR. CASSONE: Your Honor, the information that

08:36:42 1 is represented on the summaries, the charts and calculations
08:36:46 2 were gleaned from thousands of pages of sales revenue
08:36:51 3 provided by the plaintiff -- the defendant rather, two
08:36:55 4 tranches, and I think Federal Rule 1006 permits summaries.
08:37:03 5 The jury is, even though it's a short trial, it's Tuesday,
08:37:10 6 by the time Friday comes along, I don't know that the
08:37:13 7 memories of the jurors as to what they saw on the slide show
08:37:17 8 is going to endure, and I think that these charts and
08:37:21 9 summaries will assist the trier of fact.

08:37:25 10 MR. FLYNN: May I respond, Your Honor?

08:37:26 11 THE COURT: Yes.

08:37:27 12 MR. FLYNN: So we didn't object to what are
08:37:30 13 fairly characterizes as FRE 1006 summaries. And that would
08:37:35 14 be what they're planning to put in as PX 18 and PX 19 which
08:37:40 15 are how they got the underlying numbers. For example, on PX
08:37:45 16 17 where it's just Mr. Blok doing the calculations, that's
08:37:48 17 not evidence.

08:37:50 18 THE COURT: No, I understand. Frankly I have
08:37:53 19 seen it done both ways. Your position is that this is
08:37:58 20 basically a demonstrative and your position is that it's a
08:38:02 21 summary of his opinions, and his calculations so to speak?

08:38:11 22 MR. CASSONE: Yes, Your Honor.

08:38:12 23 THE COURT: But it's still an opinion as opposed
08:38:14 24 to a calculation, a summary calculation.

08:38:17 25 MR. CASSONE: I mean, as a damages expert his

08:38:20 1 opinion is a calculation.

08:38:21 2 THE COURT: Right. I understand. So what
08:38:25 3 happens when the defendant wants to do the same thing with
08:38:28 4 their expert?

08:38:29 5 MR. CASSONE: I would think the Court has a
08:38:32 6 pretty good memory, I would be hard pressed to object, Your
08:38:37 7 Honor.

08:38:37 8 THE COURT: Well, my memory is a problem
08:38:40 9 already.

08:38:41 10 MR. CASSONE: Good to know.

08:38:42 11 THE COURT: But I'll try to remember it.

08:38:45 12 So is the defendant -- I mean, your expert is
08:38:51 13 not going to put on any summary like this, I take it,
08:38:56 14 because they're going to say you don't have any damages. I
08:39:02 15 assume your expert is going to say, he's going to have a
08:39:05 16 calculation that's lower than this, or is he going to say no
08:39:09 17 damages, or is he going to say both?

08:39:12 18 MR. FLYNN: I think he's going to say both.

08:39:14 19 THE COURT: Both.

08:39:14 20 MR. FLYNN: Your Honor, my other concern is,
08:39:17 21 we're not planning to put in summaries like this as
08:39:20 22 exhibits. But the exhibits say things like see Professor
08:39:24 23 Blok's report, see the opening report. PX 17, for example,
08:39:28 24 PX 16, see the Blok reports, footnote 1.

08:39:32 25 THE COURT: I see it. I'm sure the plaintiffs

would be more than happy to remove the footnote. I think the defendant is right on this. These are demonstratives. If both sides wanted to do this, I would be happy with that. But that's not the case. So I am going to sustain the objection.

MR. FLYNN: Thank you, Your Honor.

THE COURT: What's the next issue?

MR. CASSONE: I don't know which exhibits Mr. Flynn handed to the court.

THE COURT: He's handed me 16, 17, 492, and 493. So 492 and 493 are clearly just accumulation as to what the damages are. And it looks like 16 and 17 are similar. You can display them to the jury, it's not a problem with demonstratives.

MR. CASSONE: Can I be clear about one thing Your Honor, I don't want to quarrel with the Court. But 16 is pretty much identical to 18 and 19 in terms of the information displayed and it's just a summary of his calculation. It's different than the others in that those are charts that were prepared by Mr. Blok clearly, and I understand the Court's ruling.

THE COURT: I haven't seen 18 or 19, so defendant is saying that 18 and 19 are okay.

MR. CASSONE: Right.

THE COURT: But 16 and 17 aren't because?

08:41:13 1 MR. FLYNN: So, Your Honor, for context,
08:41:16 2 Exhibit 18 is the summary of all our underlying data about
08:41:21 3 the number of accused units sold and it's just a tally sheet
08:41:25 4 that has the base numbers where that data came from.

08:41:28 5 THE COURT: Right.

08:41:29 6 MR. FLYNN: Exhibit 19 is the accused systems by
08:41:32 7 dollar amount and the average selling price. Again, pure
08:41:36 8 FRE 1006 summaries with Bates numbers of where that data
08:41:41 9 came from. Those are fine. What they can't do is put in
08:41:44 10 Exhibit 16 which is just Mr. Blok's calculation of one
08:41:49 11 versus --

08:41:50 12 THE COURT: What a reasonable royalty rate is.
08:41:54 13 And that's what it looks like to me. So I'm looking at 17,
08:41:59 14 though, average selling price, Smith estimated gross profit
08:42:04 15 margin.

08:42:06 16 MR. CASSONE: I understood the Court's ruling on
08:42:09 17 all of them, but what I am saying is that 18 and 19, 16 just
08:42:14 18 simply takes the calculations from 18 and 19 and applies
08:42:18 19 them to one another.

08:42:20 20 THE COURT: Here is what I am going to do, just
08:42:24 21 to be a nice guy. You want 19 for sure, is that it?

08:42:27 22 MR. CASSONE: I want 16, 18 and 19 they're not
08:42:31 23 objecting to, 16 of the Court's ruling, 16 is the only one
08:42:35 24 I'm getting stuck on.

08:42:38 25 THE COURT: When you do 18 and 19, and then you

08:42:38 1 put 16 up on the board, then we can have a discussion
08:42:43 2 because then I can look at the other two exhibits and make a
08:42:47 3 better decision. So I'll take this under advisement.

08:42:51 4 MR. CASSONE: Thank you, Your Honor.

08:42:52 5 THE COURT: What's the next problem, the next
08:42:54 6 little problem.

08:42:55 7 MR. FLYNN: Your Honor, we have some objections
08:42:57 8 to their slides for Mr. Blok as well. They're pretty minor.
08:43:02 9 But I think it's probably worth raising them with you now.
08:43:04 10 The first is you'll recall the Court granted our motion in
08:43:11 11 limine regarding use of the total value of the accused
08:43:15 12 products which is 266 million. There is one place in the
08:43:19 13 slide where -- and what Your Honor's ruling was is they can
08:43:23 14 use it with respect to showing the Georgia-Pacific factor no
08:43:26 15 18 that is the commercial success. There is just one place
08:43:29 16 in the slide where it's just a gratuitous use, it has
08:43:34 17 nothing to do with the calculation that's shown on the
08:43:37 18 slide, it's there to show the jury Planmeca has sold
08:43:41 19 \$266 million. It's in their slides in other places, but
08:43:44 20 that one place seems a little gratuitous at least in spirit
08:43:52 21 of the Court's ruling on this.

08:43:52 22 MR. CASSONE: I don't know which slide he's
08:43:55 23 referring to.

08:43:56 24 THE COURT: It doesn't matter, just remove it
08:43:59 25 from the slide.

08:44:01 1 MR. FLYNN: Your Honor, this has been a bit of a
08:44:03 2 recurring issue. They have got a new opinion that wasn't in
08:44:08 3 Mr. Blok's report regarding 21.98 percent profit margin.
08:44:14 4 Mr. Blok's report --

08:44:16 5 THE COURT: Is that calculated based on recent
08:44:19 6 sales?

08:44:19 7 MR. CASSONE: Yes, Your Honor, there was
08:44:21 8 additional information provided.

08:44:22 9 THE COURT: And it's calculated the same way as
08:44:25 10 his opinion?

08:44:26 11 MR. CASSONE: Yes, Your Honor.

08:44:27 12 THE COURT: That's fair game.

08:44:28 13 MR. FLYNN: Your Honor, if I may, if you look at
08:44:30 14 PX 17, the one you just excluded. He's got the profit
08:44:35 15 margin of 25 percent, that's what is in his report.

08:44:38 16 THE COURT: He's got to --

08:44:43 17 MR. CASSONE: Your Honor, he has two different
08:44:44 18 numbers for average sales price, and the reason he has two
08:44:48 19 different numbers for average sales price is he calculated
08:44:51 20 one with the discovery at one point, and then when defendant
08:44:52 21 provided additional sales data, a lot of additional sales
08:44:53 22 data, the average sales price went up. So he calculated it
08:45:00 23 both ways. Since it is arguably inconsistent, I want to
08:45:01 24 explain to the jury this is why, I had this sales data and
08:45:02 25 now I have additional sales data. That's the only reason,

08:45:14 1 but he hasn't changed the reasonable royalty rate, that's
08:45:18 2 consistent, he hasn't changed that at all.

08:45:21 3 THE COURT: I agree. I don't have a problem
08:45:23 4 with updated data as long as it's been -- as long as the
08:45:28 5 updated data is used consistent with what is reported. If
08:45:33 6 it's not consistent, then I have a problem. But apparently
08:45:37 7 it's a consistent application of his theory or his opinions
08:45:41 8 of what a reasonable royalty rate is based on your data. So
08:45:46 9 I'm going to overrule the objection. But when we do the
08:45:50 10 slides, if you want to preserve the objection, you should do
08:45:54 11 it then when I have a chance to look at them. But that's
08:45:57 12 generally my approach, as long as the data matches his
08:46:01 13 theory in the case, then I don't have a problem.

08:46:04 14 MR. FLYNN: Understood, Your Honor. We'll raise
08:46:08 15 the objection at the appropriate time.

08:46:10 16 THE COURT: Any other issues?

08:46:12 17 MR. CASSONE: None for the plaintiff, Your
08:46:14 18 Honor.

08:46:14 19 MR. FLYNN: None from defendant.

08:46:17 20 THE COURT: We have jurors filtering in. As
08:46:19 21 soon as we have a full compliment, we'll let you know, but
08:46:22 22 we'll start probably at 9:00.

08:46:32 23 MR. CASSONE: Thank you, Your Honor.

08:46:34 24 MR. FLYNN: Thank you, Your Honor.

08:46:36 25 COURT CLERK: All rise.

Massie - cross

08:46:37 1 (A brief recess was taken.)

09:05:54 2 COURT CLERK: All rise.

09:08:34 3 THE COURT: We're bringing the jury out now.

09:08:40 4 (Jury entering the courtroom at 9:08 a.m.)

09:08:56 5 THE COURT: Please be seated, ladies and
09:09:03 6 gentlemen. So on the witness stand -- we had Dr. Massie on
09:09:12 7 the witness stand, if you could come back. Doctor, I'll
09:09:23 8 remind you that you are still under oath, Dr. Massie.

09:09:33 9 You may proceed counsel.

09:09:34 10 MR. QURESHI: Your Honor, may I approach with
09:09:36 11 the witness binders?

09:09:39 12 THE COURT: Yes, you may.

09:09:42 13 CROSS-EXAMINATION

09:09:44 14 BY MR. QURESHI:

09:09:45 15 Q. Good morning, Dr. Massie.

09:09:46 16 A. Good morning.

09:09:47 17 Q. Do you still have the witness binder your counsel
09:09:50 18 gave you yesterday. That's the one I'm giving you today, do
09:09:51 19 you have the other one you had yesterday?

09:09:52 20 A. No, I handed it back to the clerk.

09:10:00 21 MR. QURESHI: May I, Your Honor?

09:10:02 22 THE COURT: Yes, you may.

09:10:10 23 Q. Just so it's clear, the white one is the one you got
09:10:12 24 yesterday from your counsel, the one with the blue cover is
09:10:14 25 the one that we are giving you today. Can you still hear me

09:10:23 1

okay?

09:10:23 2

A. Yes.

09:10:24 3

Q. Dr. Massie, did you have any conversations with your counsel about your testimony since we broke yesterday?

09:10:28 4

09:10:32 5

A. No.

09:10:32 6

Q. Okay. If you could turn to the witness binder that has the blue cover sheet, that's the one we gave you, and if you could turn to Tab 2, which is JX-1, the '301 patent. Do you see that?

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A. Yes.

09:10:50 11

Q. The '301 patent was filed on December 1st, 1999, correct?

09:10:54 12

09:10:54 13

A. Correct.

09:10:55 14

Q. And it issued from the U.S. Patent Office on April 30th, 2002?

09:10:58 15

09:11:00 16

A. Correct.

09:11:01 17

Q. Okay. If you go to that -- in that document, if you go to column 1, line 65, do you see that -- are you there, Dr. Massie?

09:11:05 18

09:11:21 19

09:11:21 20

A. No.

09:11:22 21

Q. It's column one at the bottom --

09:11:25 22

A. Of the front page?

09:11:26 23

Q. No, column one is the specification. That's the text. If you go to the bottom, the bottom paragraph is around line 65?

09:11:30 24

09:11:32 25

09:11:36 1 A. Yes.

09:11:37 2 Q. You see that sentence that says for example, and then
09:11:40 3 it lists a number of patents?

09:11:42 4 A. Yes.

09:11:42 5 Q. Do you see the patent that is numbered 5,214,686?

09:11:49 6 A. Yes.

09:11:50 7 Q. Okay. And if you turn to Tab 11 in that binder, that
09:11:56 8 is the U.S. Patent 5,214,686; correct?

09:12:03 9 A. Yes.

09:12:04 10 Q. And that's to an inventor named Webber?

09:12:08 11 A. Yes.

09:12:09 12 Q. Okay.

09:12:10 13 MR. QURESHI: Your Honor, this is the patent
09:12:11 14 that was cited in Dr. Massie's '301 patent. I ask to admit
09:12:14 15 JX-4.

09:12:17 16 THE COURT: Any objection to JX-4?

09:12:20 17 MR. OSTROW: No, Your Honor.

09:12:21 18 THE COURT: All right. It's received.

09:12:23 19 (JX Exhibit No. 4 was admitted into evidence.)

09:12:24 20 MR. QURESHI: Thank you, Your Honor.

09:12:24 21 BY MR. QURESHI:

09:12:25 22 Q. You have no idea what's included in the Webber
09:12:28 23 patent, correct?

09:12:28 24 A. Correct.

09:12:28 25 Q. Now, let's go back to your '301 patent, and if could

Massie - cross

09:12:33 1 go to column two, the next paragraph over on the top. And
09:12:37 2 go to line 5. Are you there, sir?

09:12:40 3 A. Yes.

09:12:41 4 Q. And you see there is a reference to U.S. Patent No.
09:12:45 5 RE 36,162?

09:12:47 6 A. Yes.

09:12:50 7 Q. If you turn to Tab 12 in your binder, you see DX 6
09:12:56 8 which has the U.S. Patent No. RE 36,162?

09:13:01 9 A. Yes.

09:13:01 10 Q. That's to an inventor named Messick, right?

09:13:04 11 A. Yes.

09:13:06 12 MR. QURESHI: Your Honor, I would ask, I offer
09:13:08 13 to move DX 6 into evidence. This is a patent cited in
09:13:12 14 Dr. Massie's '301 patent.

09:13:14 15 THE COURT: Any objection?

09:13:15 16 MR. OSTROW: No objection.

09:13:15 17 THE COURT: It's received.

09:13:17 18 (DX Exhibit No. 6 was admitted into evidence.)

09:13:17 19 BY MR. QURESHI:

09:13:18 20 Q. Dr. Massie you have no idea what's included in the
09:13:22 21 Messick patent, correct?

09:13:22 22 A. Correct.

09:13:24 23 Q. You can go back to the '301 patent, JX-1, and if we
09:13:32 24 go to claim one of your patent which is at column 5. Let me
09:13:32 25 know when you are there. In the middle of column 5, it's on

09:13:47 1 the screen as well. Do you see it?

09:13:55 2 A. I do.

09:13:56 3 Q. Okay. This is claim 1. And it has a number of
09:14:00 4 elements, A, B, C, D, E and F. Do you see that?

09:14:05 5 A. Yes.

09:14:06 6 Q. Let's look at element A. A controller. Controllers
09:14:10 7 were known before 1999, right?

09:14:16 8 A. I'm not sure.

09:14:18 9 Q. You don't know?

09:14:19 10 A. I'm not a patent attorney. So you know, as far as
09:14:21 11 constructing this is concerned with my patent counsel, he's
09:14:27 12 the one who constructed all of this.

09:14:30 13 Q. You're not sure what's in your claims?

09:14:32 14 A. I hired a patent attorney to write my patents, and
09:14:36 15 write all the claims. So I read it with my limited
09:14:41 16 knowledge of the law and writing patents, so I -- yes, I
09:14:46 17 have read it.

09:14:47 18 Q. Do you have an understanding of the claims of your
09:14:51 19 patent as they were filed in 1999?

09:14:53 20 A. At a very superficial level, yes.

09:14:57 21 Q. Let's see what that level is with the questions that
09:15:00 22 I have. So you don't know if controllers were known before
09:15:04 23 1999; is that correct? Just the elements, the hardware
09:15:10 24 piece, the controller?

09:15:12 25 A. According to the whole claim of 1-A, I don't know if

09:15:17 1 it existed.

09:15:18 2 Q. What about the microprocessor, were microprocessors
09:15:23 3 known before 1999?

09:15:24 4 A. Yes.

09:15:24 5 Q. What about memory, was memory known before 1999?

09:15:28 6 A. Yes.

09:15:29 7 Q. Okay. Go to element B. An input device. Were input
09:15:34 8 devices known before 1999? For example, a keyboard?

09:15:39 9 A. For example, what?

09:15:40 10 Q. For example, a keyboard?

09:15:41 11 A. Yes.

09:15:43 12 Q. Okay. Element C, I think you may have mentioned this
09:15:47 13 yesterday, motors connected to microprocessors, was that
09:15:54 14 known before 1999?

09:15:57 15 A. Yes.

09:15:59 16 Q. Element D, x-ray equipment including an x-ray source
09:16:02 17 and a detector array. Was that known before 1999?

09:16:11 18 A. In the medical field, yes.

09:16:14 19 Q. I don't see the word medical field in that element,
09:16:17 20 right, it doesn't say medical?

09:16:19 21 A. I don't see medical either.

09:16:21 22 Q. Element E, conversion means for converting a signal.
09:16:24 23 Were devices to convert signals, for example, an analog to
09:16:27 24 digital signal known before 1999?

09:16:30 25 A. Not that I am aware of in dentistry.

09:16:36 1 Q. So there is special analog to digital converters in
09:16:40 2 dentistry as opposed to generally?

09:16:42 3 A. I wasn't aware of any prior to 1999.

09:16:45 4 Q. Did you invent an analog to digital converter for
09:16:49 5 dentistry?

09:16:54 6 A. According to the patent, yes.

09:16:56 7 Q. You don't know yourself?

09:16:58 8 A. Well, I -- it's in the references cited in the
09:17:02 9 patent, yes.

09:17:03 10 Q. Show me where in your patent it describes a new
09:17:06 11 analog to digital converter for dentistry. If you can't
09:17:15 12 find it, that's fine, let me know?

09:17:17 13 A. On the '301 patent on page 1 at the very bottom, its
09:17:25 14 reference is number 20 A/D converter.

09:17:30 15 Q. Do you know that it's a stipulated fact in this case
09:17:33 16 between Osseo and Planmeca that analog to digital converters
09:17:37 17 were known before 1999?

09:17:38 18 A. I didn't know that.

09:17:39 19 Q. Do you know there are stipulated facts between the
09:17:42 20 party as to what is prior art in this case?

09:17:42 21 A. Say that to me again.

09:17:42 22 Q. Has your counsel shared with you what is stipulated
09:17:52 23 between the parties, i.e., we agree are prior art to your
09:17:52 24 patents?

09:17:52 25 A. At a very superficial level they have communicated

09:18:03 1 that to me.

09:18:04 2 Q. Have they told you that one of the things that the
09:18:06 3 parties agreed was known before 1999 are analog to digital
09:18:10 4 converters?

09:18:11 5 A. If that's what it was agreed upon, yes.

09:18:14 6 Q. Thank you.

09:18:15 7 Element F, an output device, you didn't invent
09:18:21 8 output devices, right, like a monitor, for example?

09:18:25 9 A. No.

09:18:27 10 Q. Okay. Now the claim also uses the word tomographic
09:18:32 11 modeling. Do you see that in the top?

09:18:34 12 A. Yes.

09:18:34 13 Q. You did not invent tomography, correct?

09:18:39 14 A. No.

09:18:39 15 Q. In fact your patent says tomography was known for
09:18:47 16 dental x-rays, correct?

09:18:50 17 A. If that's what it says. I don't recall it
09:18:53 18 specifically.

09:18:54 19 Q. You don't recall your patent saying that tomography
09:18:58 20 was known for dental applications in the x-ray field?

09:19:02 21 A. Yeah, I wasn't aware that tomography existed for
09:19:04 22 dental applications prior to 1999.

09:19:06 23 Q. Can we go to column one of his patent, please. We
09:19:17 24 looked at this yesterday. Bottom, line 61, this is from
09:19:22 25 your patent, Dr. Massie, tomography or sectional radiology

09:19:29 1 techniques using scanning x-ray beams have previously been
09:19:33 2 employed for dental applications?

09:19:36 3 Does that refresh your memory?

09:19:37 4 A. Yes.

09:19:38 5 Q. So, tomography was known for dental applications
09:19:41 6 before 1999, correct?

09:19:42 7 A. Yes.

09:19:45 8 Q. Now, you did not invent tomography as we established,
09:19:48 9 you also did not invent tomographic models or tomographic
09:19:52 10 modeling, correct?

09:19:54 11 A. Well, that's part of what we did invent from the very
09:20:02 12 beginning when I talked to Mr. Brown, was the ability to use
09:20:04 13 tomographic modeling to create 3D images of the patient's
09:20:10 14 dental anatomy including the bone density.

09:20:12 15 Q. And again, just to remind the jury, Mark Brown was
09:20:14 16 your patent attorney correct?

09:20:17 17 A. That's correct.

09:20:17 18 Q. Who drafted the claims of your patents?

09:20:20 19 A. Correct.

09:20:20 20 Q. All three of them, correct?

09:20:22 21 A. Yes, sir.

09:20:22 22 Q. Now, what we have here is an admission in your patent
09:20:27 23 that tomography was known, and now you're saying you
09:20:32 24 invented tomographic modeling?

09:20:32 25 A. Well, I think what this is referring to was a

09:20:40 1 scanning x-ray beam, it doesn't say it can create tomography
09:20:50 2 but it uses a scanning beam.

09:20:52 3 Q. A scanning x-ray?

09:20:54 4 A. As it states.

09:20:56 5 Q. Now, you testified yesterday that tomographic
09:20:59 6 modeling was known in medicine, correct?

09:21:01 7 A. Correct.

09:21:01 8 Q. So -- correct me if I'm wrong, your understanding of
09:21:05 9 your invention is you didn't invent the idea of tomographic
09:21:11 10 modeling, but you think you invented the idea of using
09:21:14 11 tomographic modeling for dentistry, correct?

09:21:17 12 A. Right.

09:21:18 13 Q. You did not invent tomography images, correct?

09:21:21 14 A. Correct.

09:21:21 15 Q. And you didn't invent the idea of using computer
09:21:24 16 memory to store a tomographic model, correct?

09:21:27 17 A. Correct.

09:21:27 18 Q. And you did not invent the device to merge x-ray
09:21:31 19 images or scans, correct?

09:21:32 20 A. Right.

09:21:32 21 Q. You did not invent a way to merge digital x-ray scans
09:21:41 22 into a tomographic model, correct?

09:21:42 23 A. Correct.

09:21:42 24 Q. And you did not invent an algorithm or device to
09:21:52 25 reconstruct taken x-rays into digital images or models,

09:21:55 1

correct?

09:21:55 2

A. Say that again, please.

09:21:57 3

Q. You did not invent an algorithm or device to

09:22:00 4

reconstruct taken x-rays into digital images or model

09:22:07 5

correct?

09:22:07 6

A. I did not.

09:22:08 7

Q. You did invent a 3D reconstruction algorithm,

09:22:12 8

correct?

09:22:12 9

A. Correct.

09:22:12 10

Q. You did not invent the Feldkamp Reconstructive

09:22:19 11

Algorithm to create future models, correct?

09:22:21 12

A. I don't know that what is.

09:22:21 13

Q. You don't know what the Feldkamp Reconstructive Model

09:22:25 14

is, correct?

09:22:25 15

A. That is correct.

09:22:26 16

Q. In your deposition you were not able to answer what a

09:22:30 17

tomographic 3D model means in your patents, right?

09:22:31 18

A. Correct.

09:22:31 19

Q. And you did not invent the idea of combining -- we

09:22:32 20

can take that down. You did not invent the idea of

09:22:42 21

combining or over laying 3D tomographic models, right?

09:22:42 22

A. Correct.

09:22:42 23

Q. You did not invent a way to stitch 3D models

09:22:51 24

together, correct?

09:22:51 25

A. Correct.

09:22:53 1 Q. You did not invent tomosynthesis, right?

09:22:57 2 A. Right.

09:22:57 3 Q. You did not invent computed tomography correct?

09:23:01 4 A. Correct.

09:23:01 5 Q. Computed tomography doesn't even appear anywhere in

09:23:05 6 your patents correct?

09:23:06 7 A. As far as I can recall, that's correct.

09:23:08 8 Q. And you have no understanding of how computed

09:23:10 9 tomography works, right?

09:23:12 10 A. From a mechanical, logistical engineering

09:23:14 11 perspective, that's correct. From a --

09:23:16 12 Q. I'm sorry?

09:23:18 13 A. From a clinical perspective I do.

09:23:20 14 Q. Because you have used machines that use CT?

09:23:22 15 A. That is correct.

09:23:24 16 Q. You are unable to explain how computed tomography

09:23:26 17 compares to densitometry, correct?

09:23:28 18 A. I'm sorry?

09:23:30 19 Q. You are unable to explain how CT compares to

09:23:32 20 densitometry, correct?

09:23:34 21 A. Correct.

09:23:36 22 Q. You did not invent quantitative computed tomography

09:23:38 23 or QCT, correct?

09:23:40 24 A. That is correct.

09:23:42 25 Q. And you did not invent quantitative computed

09:23:47 1 tomography to perform densitometry, correct?

09:23:51 2 A. Correct.

09:23:52 3 Q. Now, you testified in your direct examination that
09:23:56 4 around the time that you filed your application or coming up
09:23:59 5 with your idea, you did some research, I think you said you
09:24:03 6 looked at textbooks, right, do you remember that?

09:24:04 7 A. Yes.

09:24:05 8 Q. Can you explain what you did, just generally, as far
09:24:07 9 as the research you did in connection with filing your
09:24:10 10 application?

09:24:11 11 A. Well, I actually went to a library, I went to the
09:24:14 12 dental school library. I referenced texts and periodical
09:24:17 13 articles. I also looked at different textbooks relative to
09:24:20 14 all the different objectives, I looked at the medical side
09:24:23 15 to see what CT technology did and medicine, like I said
09:24:26 16 yesterday, I went and talked to the chief radiologist at my
09:24:29 17 hospital where I am on the surgical staff. And the meeting
09:24:32 18 with Dr. Christensen, I went to every resource that I could
09:24:35 19 find to get educated.

09:24:38 20 Q. And I'm glad you mentioned Dr. Christensen.
09:24:41 21 Yesterday in your direct examination, I think you offered
09:24:44 22 into evidence the NDA, the nondisclosure agreement you
09:24:47 23 signed with Dr. Christensen, correct?

09:24:50 24 A. Yes.

09:24:53 25 Q. After that NDA, you had a 45-minute meeting with him,

09:25:13 1

correct?

09:25:13 2

A. Approximately, yes.

09:25:14 3

Q. And then he pretty much stopped responding to you,

09:25:17 4

correct, with regard to pursuing your idea?

09:25:20 5

A. Other than the fact that he offered to me or

09:25:22 6

requested of me at that time, because of the time that he

09:25:27 7

had spent with me that he owned a company, at that time he

09:25:30 8

owned a company called Clinical Research and Associates, and

09:25:35 9

Clinical Research and Associates does independent third

09:25:37 10

party valuations of equipment and dental materials, and his

09:25:41 11

request of me for the time that he had spent with me was

09:25:44 12

that some day when I got the product developed that I would

09:25:50 13

return and let Clinical Research and Associates do the

09:25:54 14

actual practical testing for the product, which I agreed.

09:25:59 15

So the door was left opened for an ongoing relationship.

09:26:03 16

Q. Let me just make sure we understand that. So you

09:26:07 17

signed this NDA with the father of modern dentistry, Dr.

09:26:10 18

Christensen, correct?

09:26:11 19

A. Right.

09:26:12 20

Q. You had about a 45-minute meeting with him, correct?

09:26:14 21

A. Right.

09:26:15 22

Q. He said, he kind of stopped responding to you, but he

09:26:18 23

said hey, if you pursue your idea and it becomes something

09:26:22 24

you want to develop, then I have the Clinical Research

09:26:25 25

Associate firm that can help you put that together, right?

09:26:27 1

A. Right.

09:26:27 2

Q. But you ultimately never had anything to go to CRA with right?

09:26:33 3

09:26:33 4

A. That's right. He left the door open, he didn't stop the conversation, he stopped that conversation, but the door was left open in case I ever wanted to come back and have further discussions with him.

09:26:36 5

09:26:38 6

09:26:42 7

09:26:43 8

Q. And nothing has happened further with respect to developing your product with him or with his CRA?

09:26:45 9

09:26:48 10

A. That's correct.

09:26:49 11

09:26:51 12

Q. We were talking about your research. If we could turn to Tab 14, turn to Tab 14 in your binder. This is PX-451. Plaintiff's Exhibit 451. Do you see that?

09:26:58 13

09:27:03 14

A. Yes.

09:27:03 15

09:27:06 16

Q. This is one of the documents that you reviewed when you were doing your research, correct? Discussed in your deposition. Do you see that, Dr. Massie?

09:27:12 17

09:27:27 18

A. Yes.

09:27:28 19

Q. Okay.

09:27:29 20

MR. QURESHI: Your Honor, I offer to admit PX-451 into evidence.

09:27:32 21

09:27:32 22

THE COURT: PX-451 is which tab in this book?

09:27:32 23

MR. QURESHI: 14, sir.

09:27:32 24

THE COURT: Any objection?

09:27:42 25

MR. OSTROW: No objection.

(PX Exhibit No. 451 was admitted into evidence.)

BY MR. QURESHI:

Q. This was one of the articles or looks like a chapter in a book that you researched and it's written by a gentleman named Robert Zamenhof. Were you familiar with Mr. Zamenhof before looking at the article in the historical background section, it says the Era of true quantitative bone Dentistry began in early 1960, that's what it says, right?

A. Yes.

Q. If we go up, Mr. Herndon, to the abstract, highlight that. And you see where it says this chapter provides a review of the various techniques that have been applied to the measurement of bone marrow to the quantitative assessment of bone disease. Three of these techniques, and one of those is quantitative computed tomography. Correct?

A. What abstract are you on?

Q. I'm on the abstract, the first page, page 1.

A. Yes.

Q. So you had this paper around the time you were initially doing research on your idea; correct?

A. Yes.

Q. And this paper is not anywhere on the face of your patents as being cited to the Patent Office, correct?

A. As far as I know. I don't know.

09:29:19 1 Q. You don't know?

09:29:20 2 A. No. I haven't gone back to look.

09:29:22 3 Q. But you're not aware of this paper showing up
09:29:25 4 anywhere on the face of your patents as being cited to the
09:29:28 5 Patent Office, correct?

09:29:29 6 A. Not that I am aware of.

09:29:31 7 Q. You can close that, Dr. Massie.

09:29:33 8 Now, you have no idea whether you knew about
09:29:36 9 quantitative computed tomography before you filed your
09:29:38 10 application in 1999; right?

09:29:40 11 A. Correct.

09:29:41 12 Q. And even in 2019 when you were deposed by my
09:29:43 13 colleague, Ms. Peschel, you had no understanding of
09:29:44 14 quantitative computed tomography; correct?

09:29:54 15 A. Correct.

09:29:54 16 Q. Now, you did not invent cone beam computed
09:29:57 17 tomography, correct, or what we refer to as CBCT?

09:30:00 18 A. Correct.

09:30:00 19 Q. And cone beam computed tomography was known by the
09:30:02 20 time you filed your patent application, correct?

09:30:02 21 A. I don't know.

09:30:02 22 Q. You don't know. That's because you're not familiar
09:30:12 23 with the engineering or historical side of cone beam
09:30:15 24 computed tomography, correct?

09:30:16 25 A. That's correct.

09:30:17 1 Q. In fact, sitting here today, or at least sitting as
09:30:22 2 you did in your deposition in 2019, you had a limited, or
09:30:26 3 what you said, a very superficial understanding of cone beam
09:30:31 4 computed tomography, correct?

09:30:32 5 A. Correct.

09:30:32 6 Q. And that's because your practice bought a Sirona
09:30:36 7 machine in 2014 that did cone beam computed tomography
09:30:40 8 x-ray?

09:30:41 9 A. That's correct.

09:30:41 10 Q. So your understanding of CBCT is only from the
09:30:45 11 clinical side primarily based on because of this machine you
09:30:50 12 bought from Sirona in 2014, correct?

09:30:51 13 A. Correct.

09:30:55 14 Q. Now, that Sirona machine you have at your practice, I
09:31:00 15 imagine it was pretty expensive?

09:31:04 16 A. I'm sorry?

09:31:04 17 Q. I imagine it was pretty expensive?

09:31:07 18 A. Very.

09:31:07 19 Q. That machine that you have can produce 3D models,
09:31:12 20 correct?

09:31:12 21 A. Correct.

09:31:13 22 Q. And you did not invent 3D CBCT models or images,
09:31:20 23 correct?

09:31:21 24 A. Maybe not directly, but I invented a modeling system
09:31:25 25 using 3D CBCT technology.

09:31:32 1 Q. Okay. You don't know --

09:31:34 2 A. To physically design the machine, no.

09:31:38 3 Q. But the idea of using cone beam computed tomography
09:31:42 4 for 3D models is something you're saying you invented?

09:31:48 5 A. I didn't invent the machine to do that, no.

09:31:51 6 Q. Okay. You didn't invent the idea either, did you?
09:31:55 7 Show me where, in your patent you say you invented the idea
09:32:00 8 of 3D CBCT images or models?

09:32:04 9 A. I invented 3D -- a modeling system using 3D cone beam
09:32:10 10 technology.

09:32:10 11 Q. Show me in your patent where you say -- where it says
09:32:13 12 CBCT or cone beam computed tomography?

09:32:14 13 A. I can't show you that.

09:32:14 14 Q. So with your Sirona machine, you can compare 3D
09:32:21 15 models or images, correct?

09:32:21 16 A. Yes.

09:32:21 17 Q. And you can take a model of a patient on Monday and
09:32:31 18 then take the model of that patient on Friday and compare
09:32:34 19 the two to see if there has been any change, correct?

09:32:37 20 A. I do that all the time.

09:32:38 21 Q. You do that all the time, I assume you have done that
09:32:41 22 with x-ray images since you started in the industry correct?

09:32:42 23 A. Yes.

09:32:44 24 Q. And you do that with your eyes correct?

09:32:45 25 A. Correct. Well I do it with my eyes but I also use

09:32:49 1 some of the software techniques that are built into the
09:32:52 2 machine to assist me.

09:32:53 3 Q. Let's talk about that. So are you talking about
09:32:57 4 features that the Sirona machine has where you can put the
09:33:00 5 images side-by-side?

09:33:01 6 A. Yes.

09:33:01 7 Q. Are you talking about features that the Sirona
09:33:04 8 machine has where you might be able to put one image on top
09:33:07 9 of the other?

09:33:07 10 A. Yes.

09:33:08 11 Q. And then with your eyes see what the differences are,
09:33:12 12 correct?

09:33:13 13 A. Correct.

09:33:16 14 Q. Now, were you aware of a machine called the NewTom
09:33:23 15 9000 in or before 1999?

09:33:24 16 A. No.

09:33:25 17 Q. Have you heard of it today, up until today, had you
09:33:28 18 ever heard of the machine call --

09:33:31 19 A. I have.

09:33:31 20 Q. What is your understanding of the NewTom 9000?

09:33:32 21 A. Very limited.

09:33:34 22 Q. You understand it's 3D CBCT machine for dental
09:33:38 23 application?

09:33:40 24 A. I have heard that.

09:33:42 25 Q. Do you know when the NewTom machine came out?

09:33:43 1 A. I have no idea.

09:33:44 2 Q. You don't know that it came out in the 90s?

09:33:46 3 A. I have no idea.

09:33:47 4 Q. You haven't looked it up to see when it came out?

09:33:50 5 A. No.

09:33:50 6 Q. Can we put claim 1 of the '301 back up, please. And
09:33:58 7 again, Dr. Massie, this is Tab 2 in JX-1 in your binder if
09:34:03 8 you want to look at it on paper. It's also on the screen.
09:34:06 9 Claim 1. Now, claim 1 also includes the word densitometry,
09:34:12 10 what we're all here about, right? Right there in the second
09:34:20 11 line, among other places?

09:34:23 12 A. Yes.

09:34:24 13 Q. Now, you understand the court has ordered a
09:34:27 14 construction of the word densitometry; correct?

09:34:30 15 A. Correct.

09:34:31 16 Q. And what do you understand the Court's claim
09:34:34 17 construction order to be?

09:34:37 18 A. In a very limited way was basically to give
09:34:41 19 definition to both the plaintiff and the defendant of
09:34:45 20 certain terms.

09:34:48 21 Q. Okay. And do you know what the Court's construction
09:34:49 22 of densitometry is in this case?

09:34:50 23 A. I have heard it and read it. Other than that, that's
09:34:54 24 all I know about it.

09:34:55 25 Q. But you don't have an understanding of what the

09:34:59 1 Court's construction of densitometry means?

09:35:01 2 A. No. I have left that to my patent counsel.

09:35:06 3 Q. Now, you heard the construction of quantitative
09:35:10 4 calculated bone density, what is the Court's construction of
09:35:14 5 densitometry, right, does that sound familiar?

09:35:16 6 A. I have heard that, right.

09:35:18 7 Q. Now, your patents talk about dual energy x-ray
09:35:21 8 systems as one known way to perform densitometry; correct?

09:35:26 9 A. Correct.

09:35:27 10 Q. And sitting here today, or at least when you did in
09:35:32 11 your deposition in 2019, you don't have an understanding of
09:35:35 12 what dual energy x-ray systems are, correct?

09:35:37 13 A. Correct.

09:35:38 14 Q. And your patents refer to another way to do
09:35:43 15 densitometry that's in the prior art which is called bone
09:35:47 16 morphology density, correct?

09:35:50 17 A. Correct.

09:35:50 18 Q. And that was known, right?

09:35:52 19 A. Yes.

09:35:52 20 Q. Now, you, I assume, even though you're not an
09:35:57 21 engineer, you're obviously a very smart guy, you know
09:36:00 22 density is calculated by mass divided by volume right?

09:36:04 23 A. From a physics perspective, right.

09:36:07 24 Q. Do your patents anywhere talk about doing
09:36:12 25 densitometry in a way other than dual energy, bone

09:36:15 1 morphology density, or calculating mass divided by volume?

09:36:22 2 A. I don't believe so. But I don't recall any -- any
09:36:27 3 other specific --

09:36:28 4 Q. Sitting here today, you don't recall any other
09:36:31 5 instances?

09:36:32 6 A. Right.

09:36:33 7 Q. Now, there are no drawings in your patents of what a
09:36:37 8 tomographic densitometry model looks like according to your
09:36:40 9 invention, correct?

09:36:41 10 A. Correct.

09:36:42 11 Q. Now, you testified yesterday that densitometry has
09:36:47 12 been used in the medical field to assess bone loss and
09:36:52 13 decay, correct?

09:36:53 14 A. Correct.

09:36:58 15 Q. And in your mind, densitometry in orthopedics to look
09:37:03 16 at decalcification and breakdown of bones is relatively the
09:37:08 17 same as densitometry to assess bone and teeth in dentistry,
09:37:15 18 right?

09:37:15 19 A. Correct.

09:37:19 20 Q. In other words, the densitometry you discuss in your
09:37:24 21 patents for bone and teeth in the mouth and jaw area would
09:37:29 22 have been the same or relatively the same as densitometry
09:37:34 23 for bone in other parts of the body, correct?

09:37:39 24 A. Correct.

09:37:44 25 Q. Now, in your depo, in your deposition, sorry, you

09:37:35 1 were not able to address how your invention addresses the
09:37:40 2 difference in decalcification in teeth versus bone because
09:37:46 3 your prosecuting counsel drafted the claims, correct?

09:37:49 4 A. That's correct.

09:37:51 5 Q. Now nowhere in your direct examination that
09:37:54 6 Mr. Ostrow did with you did you say that someone told me, it
09:38:00 7 was the idea of doing densitometry in the dental field
09:38:03 8 wouldn't work, correct?

09:38:05 9 A. Correct.

09:38:07 10 Q. Now, other than taking x-ray equipment in medicine
09:38:12 11 that was known and putting it around a patient's head for
09:38:16 12 dental purposes, there is no other change that's described
09:38:21 13 in your patent regarding what you would need to do to change
09:38:24 14 your diagnostic imaging system from the medical to the
09:38:28 15 dental side, correct?

09:38:29 16 A. Yeah, we didn't compare.

09:38:31 17 Q. Now your patents say nothing about radio density,
09:38:35 18 correct?

09:38:35 19 A. Correct.

09:38:39 20 Q. Do you know the difference between radio density and
09:38:42 21 bone density?

09:38:42 22 A. From an engineering perspective, I do not.

09:38:44 23 Q. Your patents say nothing about linear attenuation or
09:38:47 24 measuring linear attenuation, correct?

09:38:51 25 A. Correct.

09:38:53 1 Q. If you go back to Tab 2, which is JTX-2, admitted
09:38:58 2 yesterday, this is the '262 patent. Do you have that in
09:39:06 3 front of you, sir?

09:39:13 4 A. Yes.

09:39:14 5 Q. Now the '262 patent was filed on January 4th, 2003,
09:39:18 6 and it issued on September 13th, 2002. Correct?

09:39:29 7 A. It issued on September 13th, 2005.

09:39:32 8 Q. I'm sorry, you're correct. So it issued on
09:39:35 9 September 13, 2005. Right. Do you have that?

09:39:39 10 A. I do.

09:39:41 11 Q. Now, you showed the jury yesterday figures four A,
09:39:47 12 four B, four C, and four D, or some subset of those. Do you
09:39:53 13 recall that?

09:39:53 14 A. I do.

09:39:54 15 Q. Now, these figures, four A, four B, four C and four
09:39:59 16 D, they show the source as being an electron beam source,
09:40:05 17 correct?

09:40:05 18 A. Correct.

09:40:05 19 Q. And you're aware that electron beam sources are not
09:40:10 20 x-ray sources, correct?

09:40:11 21 A. No.

09:40:12 22 Q. You disagree with that?

09:40:15 23 A. Here again, this was put together by my patent
09:40:18 24 counsel. I was of the understanding that electron beam
09:40:22 25 sources were x-ray sources.

09:40:26 1 Q. That is your understanding from your patent counsel.
09:40:27 2 Do you have your own understanding that electron beams are
09:40:32 3 not X-ray beams?

09:40:34 4 A. No.

09:40:36 5 Q. Now, in this images, four A through four D, the
09:40:41 6 source is fixed, right? It's not being shown as moving
09:40:45 7 around, right?

09:40:45 8 A. No.

09:40:46 9 Q. So it's not computed tomography, is it?

09:40:50 10 A. I don't know that correlation.

09:40:52 11 Q. You don't know the correlation. Okay. Now,
09:40:54 12 Dr. Massie, you didn't -- we can take that down.

09:41:01 13 Dr. Massie, you did not invent the idea of
09:41:04 14 placing a patient's dental structure between an x-ray source
09:41:08 15 and an x-ray sensor, correct?

09:41:11 16 A. Correct.

09:41:18 17 Q. And your patents don't describe how you compare 3D
09:41:23 18 models or volumes, right?

09:41:25 19 A. How to compare them, no.

09:41:27 20 Q. And your patents do not describe any particular
09:41:32 21 technique for a computer to compare two images, correct?

09:41:32 22 A. Correct.

09:41:37 23 Q. But again, as we've talked about, dentists ever since
09:41:42 24 x-ray images were around use their eyes to look at images
09:41:44 25 whether it's both on the screen at the same time or separate

09:41:49 1 to make diagnoses, right?

09:41:51 2 A. That's what we're trained to do.

09:41:53 3 Q. That's what you're trained to do.

09:41:56 4 Now it was known before your patents to compare
09:41:58 5 a patient's bone density models over time, right?

09:42:03 6 A. In the medical field, yes.

09:42:05 7 Q. And when you compare x-ray images, you're looking at
09:42:15 8 the different shades of gray scale or black and white in the
09:42:19 9 x-rays with your professional experience and expertise to
09:42:23 10 see if there are changes that might indicate some issue or
09:42:27 11 need for treatment, correct?

09:42:28 12 A. Yeah, I never really looked at it from a gray scale
09:42:31 13 perspective, I'm looking at differences in the changing of
09:42:35 14 gray from image to image but also within that image.

09:42:38 15 Q. Okay. Now, can we put claim 1 of the '262 patent up,
09:42:41 16 please. JTX-0002. I just want to point out to the jury
09:42:51 17 since we haven't really looked at the claims in detail yet.
09:43:01 18 Claim 1. The bottom of claim 1. And so this spills over to
09:43:08 19 the next page but this is the beginning of it. Claim 1 of
09:43:11 20 the '262 patent uses the word densitometry; correct?

09:43:12 21 A. On what page of the patent?

09:43:12 22 Q. It's column 8 at the bottom, it's where claim 1
09:43:22 23 starts.

09:43:32 24 A. And your question was, counsel?

09:43:32 25 Q. It uses the word densitometry, right?

09:43:43 1 A. Correct.

09:43:43 2 Q. If we can go over to the top of the next page,
09:43:47 3 Mr. Herndon. This is the rest of claim 1 there in column 9,
09:43:53 4 spills over to column 10. But there are several other
09:43:57 5 instances of the word densitometry in claim 1 of the '262
09:44:00 6 patent, correct?

09:44:01 7 A. Correct.

09:44:02 8 Q. If you could turn to Tab 4 of your binder, please.
09:44:09 9 And that's JX-3 which has been admitted, that's the '374
09:44:14 10 patent, correct?

09:44:14 11 A. Yes.

09:44:15 12 Q. And that was filed on September 14, 2012; right?

09:44:18 13 A. Correct.

09:44:19 14 Q. And I'll try to get it right this time, it was issued
09:44:21 15 July 30, 2013, right?

09:44:24 16 A. Correct.

09:44:25 17 Q. Now, can we go to claim 1 of the '374 patent. Column
09:44:34 18 five. Let me know when you're there, Dr. Massie.

09:44:37 19 A. I'm there.

09:44:40 20 Q. Now, here is claim 1 of the '374 patent. We saw that
09:44:42 21 the word densitometry is included in the claims of the '301
09:44:42 22 patent. We just saw that the word densitometry is included
09:44:52 23 in claim 1 of the '262 patent. But the word densitometry is
09:44:52 24 not in claim 1 of the '374 patent; correct?

09:45:20 25 A. Correct.

09:45:21 1 Q. Why not?

09:45:24 2 A. That's a question for Mr. Brown.

09:45:26 3 Q. You don't know why the word densitometry is not in
09:45:29 4 the '374 patent claims?

09:45:31 5 A. I do not.

09:45:31 6 Q. Was it your direction to take densitometry out?

09:45:34 7 A. No.

09:45:35 8 Q. So as a named inventor, the only named inventor of
09:45:41 9 the claims in the '374 patent, you don't know why the word
09:45:41 10 densitometry was left out of this patent but included in the
09:45:51 11 claims of the first two patents; is that right?

09:45:51 12 A. Correct.

09:45:51 13 Q. So it was Mr. Brown's decision to take the word
09:45:51 14 densitometry out?

09:45:51 15 A. I don't know.

09:45:51 16 Q. Who else might it be?

09:46:01 17 A. I don't know.

09:46:01 18 Q. It wasn't you, you're not sure if it was Mr. Brown.
09:46:01 19 Who else may have made the decision to take the word
09:46:10 20 densitometry out of claim 1 of the '374 patent?

09:46:11 21 A. I don't know.

09:46:11 22 Q. Okay. Now, even though the word densitometry is not
09:46:11 23 in claim 1 of the '374 patent, this court has construed
09:46:21 24 tomographically modeling to include densitometry, correct?

09:46:31 25 A. I believe so.

09:46:33 1 Q. Because the Court's construction of tomographically
09:46:38 2 modeling includes the word densitometry, right?

09:46:41 3 A. Right.

09:46:42 4 Q. So effectively now densitometry is in the claim 1 of
09:46:45 5 the '374 patent, correct?

09:46:49 6 A. I'm not an attorney and I'll leave that up to the
09:46:52 7 court.

09:46:53 8 Q. Okay. And the jury. The court.

09:47:01 9 Dr. Massie, none of the patent claims use the word radiation,
09:47:04 10 correct?

09:47:06 11 A. I'm sorry?

09:47:07 12 Q. None of your patent claims use the word radiation,
09:47:10 13 correct?

09:47:11 14 A. Not that I recall.

09:47:12 15 Q. Okay. Now, do your patents ever say that
09:47:14 16 densitometry can be done with grayscale images?

09:47:21 17 A. Not that I recall anywhere.

09:47:24 18 Q. Do your patents say that densitometry can be done
09:47:27 19 based on Hounsfield Units?

09:47:31 20 A. Not that I recall.

09:47:32 21 Q. And Hounsfield Units aren't even mentioned anywhere
09:47:34 22 in your patents, correct?

09:47:37 23 A. I don't believe so.

09:47:38 24 Q. You didn't invent Hounsfield Units?

09:47:41 25 A. No, sir.

09:47:42 1 Q. And you don't know what Hounsfield Units measure,
09:47:45 2 right?

09:47:45 3 A. I have a limited exposure to it from my radiology
09:47:50 4 class in dental school. It was referenced, but other than
09:47:53 5 that, no.

09:47:54 6 Q. And when you had your deposition, you didn't know
09:47:58 7 what Hounsfield Units measure, right?

09:48:02 8 A. Right.

09:48:02 9 Q. You don't use Hounsfield Units to make diagnoses,
09:48:07 10 right?

09:48:08 11 A. Right.

09:48:08 12 Q. And your patents never say that Hounsfield Units are
09:48:13 13 a measure of density, right?

09:48:15 14 A. Correct.

09:48:16 15 Q. Now, I think you said you testified that you are the
09:48:24 16 sole representative of Osseo; correct?

09:48:26 17 A. That's correct.

09:48:27 18 Q. So everything that Osseo sends or submits is done
09:48:31 19 with your authority, correct?

09:48:32 20 A. Correct.

09:48:32 21 Q. Has Osseo ever taken the position that gray scale
09:48:37 22 variations are a qualitative way to measure density?

09:48:42 23 A. Other than through my legal team, Osseo hasn't taken
09:48:47 24 a position. It's been up to our legal -- the attorney that
09:48:52 25 actually wrote the patents and my legal team represented

09:48:57 1

here today.

09:48:58 2

Q. Okay. But your legal team represents Osseo, which is effectively you, right?

09:49:02 3

09:49:04 4

A. Right.

09:49:04 5

Q. And you said that everything that's submitted or sent on behalf of Osseo is with your authority, right?

09:49:06 6

09:49:10 7

A. Right.

09:49:11 8

Q. I'm going to re-ask the question. Has Osseo ever taken the position that grayscale variations are a qualitative way to measure density?

09:49:14 9

09:49:19 10

A. Osseo itself has not.

09:49:21 11

09:49:31 12

MR. QURESHI: Your Honor, may I approach with the document?

09:49:33 13

09:49:34 14

THE COURT: Yes, you may.

09:49:41 15

BY MR. QURESHI:

09:49:41 16

Q. Do you see the document that the Court has just handed you?

09:49:51 17

09:49:51 18

A. Yes.

09:49:52 19

Q. Are you familiar with this document?

09:49:54 20

A. No.

09:49:55 21

Q. Okay. Now, you said that everything that's submitted or sent on behalf of Osseo is done with your authority, but now you're saying you're not familiar with this document?

09:49:59 22

09:50:02 23

A. Yes, I am.

09:50:04 24

09:50:05 25

Q. Okay. And what is this document, sir?

Massie - cross

09:50:12 1 A. Let me finish looking at it.

09:50:17 2 (Witness reviewing document.)

09:50:57 3 Q. Have you had a chance to look through it?

09:51:00 4 A. On second thought, I don't believe I have ever seen
09:51:04 5 this document.

09:51:04 6 Q. You don't believe you have ever seen it, even though
09:51:08 7 you said you have to authorize any documents that are
09:51:10 8 submitted on your behalf correct?

09:51:12 9 A. Correct.

09:51:13 10 MR. QURESHI: Your Honor, I will ask under
09:51:14 11 Federal Rule of Evidence 801(d) as a statement against an
09:51:20 12 opposing party that was made by a person whom the party
09:51:24 13 authorized to make a statement on the subject to bring this
09:51:29 14 into objection as DX-151.

09:51:31 15 THE COURT: Any objection to DX-151?

09:51:40 16 MR. OSTROW: Give me a second Your Honor, I'm
09:51:43 17 sorry, it's labeled DX, is there a DX number on it?

09:51:47 18 MR. QURESHI: It was being used for impeachment
09:51:49 19 but I have to disclose it, but it will be DX-151.

09:52:30 20 MR. OSTROW: Your Honor, can we have a side-bar?

09:52:32 21 THE COURT: Yes, you may.

09:52:32 22 (Side-bar discussion:)

09:54:02 23 MR. OSTROW: I just wanted to confirm we have
09:54:02 24 the text, this was part of the so-called script.

09:54:02 25 THE COURT: This is straight from the court

09:54:01 1 file?

09:54:01 2 MR. QURESHI: Yes, do you want to check it?

09:54:01 3 THE COURT: No, I don't care.

09:54:01 4 MR. OSTROW: I'll take Mr. Qureshi's word for
09:54:01 5 it.

09:54:01 6 THE COURT: Just for the record, this document
09:54:01 7 is pulled from the court file Document 34, in this case,
09:54:01 8 correct?

09:54:01 9 MR. QURESHI: Yes.

09:54:01 10 THE COURT: Okay. And you have an objection?

09:54:01 11 MR. OSTROW: No.

09:54:01 12 THE COURT: All right. DX 151 is received
09:54:01 13 without objection.

09:54:01 14 (DX Exhibit No. 151 was admitted into evidence.)

09:54:01 15 MR. QURESHI: Thank you, Your Honor.

09:54:01 16 BY MR. QURESHI:

09:54:01 17 Q. Can we put the front page of DX-151 up on the screen,
09:54:01 18 please. This is the document you were looking at. This is
09:54:01 19 a document that was filed with the court on July 9, 2018 and
09:54:01 20 it's entitled Technology Tutorial, submitted by plaintiff,
09:54:01 21 Osseo Imaging LLC. Do you see that?

09:54:01 22 A. Yes.

09:54:01 23 Q. If we go to slide 17, you see the -- this is a slide
09:54:01 24 that says densitometry, methods of measuring density, in
09:54:01 25 dental field used to identify varying densities within bone

09:55:00 1 structure, and there is two sub bullets, do you see that?

09:55:02 2 A. Yes.

09:55:03 3 Q. It says can be qualitative or relative density,
09:55:08 4 grayscale variations, right?

09:55:09 5 A. That's what it says.

09:55:10 6 Q. In the next sub bullet it says can be quantitative,
09:55:14 7 it says bone morphology density, correct?

09:55:17 8 A. Yes.

09:55:17 9 Q. In this filing with the court, Osseo took the
09:55:21 10 position that grayscale variations are qualitative relative
09:55:25 11 density, correct?

09:55:30 12 A. Correct.

09:55:38 13 Q. If we go to the next slide, slide 18. Here is
09:55:45 14 another slide that Osseo submitted on the topic of
09:55:48 15 densitometry and the second says in other option, or other
09:55:52 16 option is to depict varying densities qualitatively, or in
09:55:59 17 (varying color), right?

09:56:01 18 A. Yes.

09:56:01 19 Q. So here Osseo is saying varying color is depicting
09:56:07 20 varying density qualitatively, correct?

09:56:10 21 A. Yes.

09:56:15 22 Q. We can put that document up, Dr. Massie. Do you know
09:56:18 23 what pixels are?

09:56:21 24 A. Could I define a pixel, no. I know that they're used
09:56:27 25 in digital x-ray technology.

09:56:29 1 Q. And you did not invent the idea of using numbers to
09:56:33 2 represent pixel values, correct?

09:56:35 3 A. Correct.

09:56:35 4 Q. Do you know what voxels are?

09:56:38 5 A. Very limited, also.

09:56:39 6 Q. And you didn't invent the idea of using numbers to
09:56:43 7 represent voxels value, correct?

09:56:45 8 A. Correct.

09:56:47 9 Q. Are you familiar with RSNA.

09:56:50 10 A. I'm sorry, say that again.

09:56:51 11 Q. Are you familiar with RSNA?

09:56:53 12 A. No.

09:56:55 13 Q. So I assume by not being familiar with it, you don't
09:57:00 14 get their journals or attend their conferences?

09:57:03 15 A. I don't know what it is.

09:57:05 16 Q. Okay. This is a demonstrative, Dr. Massie, it will
09:57:21 17 be on your screen, I can give you a paper copy if you want.

09:57:30 18 DDX 2 --

09:57:38 19 THE COURT: Counsel, what number again?

09:57:40 20 MR. QURESHI: DDX 2.1 it's a demonstrative.

09:57:45 21 THE COURT: Thank you.

09:58:01 22 Q. Dr. Massie, do you know whether these are CT images?

09:58:05 23 A. Say that again, please.

09:58:06 24 Q. Do you know whether these are CT images?

09:58:10 25 A. I am not for sure.

09:58:12 1 Q. Do you know if this shows CT images that reflect
09:58:16 2 densitometry?

09:58:18 3 A. I don't know.

09:58:20 4 Q. Can we go to the next slide, DDX 2.2. Do you know if
09:58:27 5 this is a CT image or images?

09:58:29 6 A. They look similar to what I read on my machine, yes.

09:58:33 7 Q. Do these CT images show densitometry?

09:58:38 8 A. From a clinician's perspective, no.

09:58:43 9 Q. Why not?

09:58:45 10 A. Because it doesn't give me a way to compare it, it
09:58:49 11 doesn't give me -- the images are very poor to start with
09:58:53 12 for references, which I would not accept in my practice.

09:58:59 13 Q. Now, these are images of teeth? These are images of
09:59:03 14 teeth?

09:59:03 15 A. They appear to be, yes.

09:59:05 16 Q. Now, if this image was created using Hounsfield
09:59:11 17 Units, would it be showing densitometry?

09:59:14 18 A. I don't know that well enough to be able to speak on
09:59:16 19 it, that's an engineering question.

09:59:18 20 Q. Let's move to the next slide, DDX 2.3. Are these CT
09:59:24 21 images?

09:59:25 22 A. It would appear so, yes.

09:59:27 23 Q. And do these CT images show densitometry?

09:59:32 24 A. Not that I can correlate.

09:59:35 25 Q. And would your answer change if you knew that any of

09:59:38 1 these images were created using Hounsfield Unit values?

09:59:46 2 A. No.

09:59:46 3 Q. Now, is showing a Hounsfield Unit value on an image
09:59:52 4 sufficient to show densitometry?

09:59:54 5 A. I don't know enough about Hounsfield Unit
09:59:58 6 measurements and analysis to be able to answer that.

10:00:01 7 Q. Okay. If you can -- we can take that down.

10:00:05 8 If you can turn to Tab 15 of your binder, which
10:00:09 9 is DX-93. Do you have that open?

10:00:14 10 A. I do.

10:00:19 11 Q. Are you familiar with this document?

10:00:21 12 A. No.

10:00:24 13 Q. All right. Let's switch gears, Dr. Massie.

10:00:27 14 Osseo Imaging LLC was formed in Missouri in
10:00:32 15 September 2004; right?

10:00:33 16 A. That's correct.

10:00:34 17 Q. And it was reorganized under a Kansas law in
10:00:37 18 July 2011?

10:00:39 19 A. That's correct.

10:00:40 20 Q. Okay. Now Osseo has no working prototype, correct?

10:00:41 21 A. That's correct.

10:00:42 22 Q. Osseo has never put together a product, correct?

10:00:43 23 A. Correct.

10:00:44 24 Q. And as of 2009, Osseo had no product or investment
10:00:52 25 funding, correct?

10:00:54 1 A. Correct.

10:00:55 2 Q. And as of 2009, Osseo had no success in getting
10:01:02 3 investment money to develop a product, right?

10:01:03 4 A. Correct.

10:01:04 5 Q. And to this day, Osseo has not made, sold, or offered
10:01:08 6 for sale any product or systems that practice the invention,
10:01:13 7 or the claimed invention of your patents, correct?

10:01:15 8 A. That's correct.

10:01:16 9 Q. And Osseo has no product or sales revenue, correct?

10:01:20 10 A. Correct.

10:01:21 11 Q. Now, throughout Osseo's history, you have tried to
10:01:24 12 partner with companies to build a product or get investment
10:01:30 13 money, correct?

10:01:30 14 A. That's correct.

10:01:31 15 Q. And no company has successfully partnered with Osseo
10:01:35 16 to achieve that, correct?

10:01:38 17 MR. CASSONE: Objection. Your Honor, may we
10:01:40 18 have a side-bar?

10:01:41 19 THE COURT: Your objection is in what -- what
10:01:45 20 was the nature of your objection?

10:01:47 21 MR. CASSONE: Well, the nature of the objection
10:01:49 22 is there is a stipulation between the parties and I think
10:01:52 23 counsel is approaching that edge.

10:01:53 24 THE COURT: Yes, I think he's on the edge.

10:01:55 25 MR. QURESHI: I'm not sure what stipulation.

Massie - cross

10:01:57 1 THE COURT: Okay. I don't like taking a morning
10:02:02 2 break this early. Can you switch gears and then we can come
10:02:05 3 back to this at the break.

10:02:07 4 MR. QURESHI: Absolutely.

10:02:08 5 THE COURT: Go ahead.

10:02:09 6 BY MR. QURESHI:

10:02:09 7 Q. Yesterday, Dr. Massie, your counsel put up a letter
10:02:12 8 from Nobel Biocare, do you recall that?

10:02:15 9 A. Yes.

10:02:16 10 Q. And Nobel Biocare decided not the partner with you,
10:02:20 11 correct?

10:02:20 12 A. Correct.

10:02:21 13 Q. There was another company named Care Stream Health
10:02:24 14 that you reached out, used to be Eastman Kodak, they decided
10:02:29 15 not to pursue your idea, correct?

10:02:31 16 A. Correct.

10:02:31 17 Q. In another example you tried to partner with a
10:02:34 18 company called Imaging Sciences, correct?

10:02:34 19 A. Correct.

10:02:37 20 Q. That was around 2005?

10:02:38 21 A. Correct.

10:02:39 22 Q. If you could turn to Tab 18 in your book. Are you
10:02:51 23 there?

10:02:52 24 A. Yes.

10:02:52 25 Q. And that's DX-146. Is this the correspondence that

10:02:57 1 was shown to you during your deposition regarding your
10:03:00 2 exchanges with Imaging Sciences around 2005?

10:03:35 3 A. (Witness reviewing document.) Yes.

10:03:53 4 Q. Okay.

10:03:53 5 MR. QURESHI: Your Honor, I offer DX-146 into
10:03:56 6 evidence.

10:03:56 7 THE COURT: Any objection to 146?

10:04:06 8 MR. OSTROW: No objection.

10:04:07 9 THE COURT: 146 is received.

10:04:10 10 (DX Exhibit No. 146 was admitted into evidence.)

10:04:11 11 BY MR. QURESHI:

10:04:12 12 Q. Can we put up the first page of DX-146, please. This
10:04:14 13 is the first page of that exhibit, it's from Imaging Signs
10:04:21 14 International, and it's dated May 5th -- I'm sorry, a
10:04:25 15 package, May 5th, 2005, there on the top right. And it's to
10:04:31 16 you, correct?

10:04:35 17 A. Yes.

10:04:35 18 Q. And Imaging Science was not interested in partnering
10:04:39 19 with you to develop your patents, correct?

10:04:40 20 A. Correct.

10:04:42 21 Q. We can take that down. And Osseo tried to partner
10:04:42 22 with a company called Hologic, who declined to move forward
10:04:52 23 with you?

10:04:52 24 A. Correct. We contacted them in an effort to try to
10:04:55 25 partner, right.

10:04:56 1 Q. And they did not?

10:04:57 2 A. Right.

10:04:57 3 Q. Same with Lunar, you had reached out to them and they
10:05:01 4 did not pursue your idea?

10:05:02 5 A. Right.

10:05:03 6 Q. A company called True North Investments?

10:05:06 7 A. Yes.

10:05:06 8 Q. A company named Sirona also declined to partner with
10:05:10 9 Osseo, correct?

10:05:10 10 A. Correct.

10:05:11 11 Q. I think we talked about yesterday Suni Medical
10:05:14 12 Imaging or Paul Suni, for whatever reason was not able to
10:05:17 13 partner with Osseo?

10:05:18 14 A. Correct.

10:05:18 15 Q. A company named Nutra Holdings did not partner with
10:05:22 16 you, correct?

10:05:23 17 A. Correct.

10:05:23 18 Q. A company named Bionex declined to partner with
10:05:28 19 Osseo, correct?

10:05:28 20 A. They showed interest initially by contacting us and
10:05:32 21 then there was no relationship established.

10:05:34 22 Q. And a company named Vatach, V-A-T-A-C-H, also
10:05:40 23 declined to partner with Osseo, correct?

10:05:42 24 A. Correct.

10:05:44 25 Q. Now, you told the jury yesterday when Mr. Ostrow was

10:05:49 1 asking you questions, that back in 2009, you believed that
10:05:55 2 Planmeca was infringing your patents, right?

10:05:57 3 A. I saw some things advertised in some of my
10:06:01 4 periodicals that I questioned whether or not it was an
10:06:03 5 infringement. Then I contacted my patent counsel, Mark
10:06:07 6 Brown.

10:06:07 7 Q. You did not do any comparison of whatever Planmeca
10:06:10 8 product information you had with the claims of your patent;
10:06:13 9 correct?

10:06:13 10 A. Correct.

10:06:14 11 Q. Now, you have never used a Planmeca ProMax system,
10:06:18 12 correct?

10:06:18 13 A. That's correct.

10:06:18 14 Q. And you're not aware of any differences between
10:06:21 15 Planmeca's ProMax 2D and 3D products; correct?

10:06:25 16 A. Correct.

10:06:26 17 Q. Now, you never attended a seminar where the ProMax
10:06:31 18 product was demonstrated to a group of people, correct?

10:06:34 19 A. I have been to different dental symposiums and dental
10:06:40 20 meetings where I have seen Planmeca demonstrating for the
10:06:44 21 purposes of sale in the exhibit section.

10:06:44 22 Q. Now, you have never been within ten feet of a
10:06:50 23 demonstration of a ProMax unit, right?

10:06:52 24 A. Not intentionally.

10:06:52 25 MR. QURESHI: Your Honor, I'm going to switch

gears. If the Court wants to take a break, I have about maybe fifteen minutes left.

THE COURT: Ladies and gentlemen, we have to take up some issues with the lawyers. So I think we'll take our break at this time, our morning break. We'll take fifteen minutes.

COURT CLERK: All rise.

(Jury leaving the courtroom at 10:07 a.m.)

THE COURT: The record should reflect that we're outside the presence of the jury. Doctor, you may step down if you like. So if everyone will be seated.

So Mr. Cassone, you raised the objection to this line of questioning, so if you would proceed.

MR. CASSONE: Yes, Your Honor. We had entered a stipulation I believe approved by the Court, Document 182 in the case, and it's a stipulation that during the trial, neither party will refer to the Osseo settlement agreements, will not refer to or suggest the presence or absence of those agreements.

THE COURT: No, I remember that.

MR. CASSONE: Yeah. And I believe that counsel was approaching the border line there and that's why I stood up and objected.

THE COURT: So your response, counsel?

MR. QURESHI: Yes, Your Honor, I am aware of

10:09:07 1 that stipulation. I didn't know what he was referring to --
10:09:09 2 I was very careful of my question to say product or sales
10:09:14 3 revenue, I did not say settlement agreement.

10:09:19 4 THE COURT: I don't think that's where he was
10:09:22 5 going.

10:09:22 6 MR. CASSONE: Well, and I did hear the question
10:09:25 7 and I almost objected when he said that because the presence
10:09:28 8 or absence of those agreements would be, you know, that
10:09:32 9 would be reflective of that, however I sat, I waited for the
10:09:37 10 next question, I believe.

10:09:38 11 THE COURT: Okay. Are you satisfied with this
10:09:42 12 issue right now?

10:09:43 13 MR. CASSONE: So far Your Honor, yes.

10:09:46 14 MR. QURESHI: I have no more questions.

10:09:48 15 MR. CASSONE: I was raising the objection
10:09:49 16 because I knew it would be too late if I waited.

10:09:53 17 MR. QURESHI: I'm done with that line of
10:09:54 18 questioning, Your Honor.

10:09:55 19 THE COURT: So you have about fifteen minutes
10:09:56 20 left?

10:09:57 21 MR. QURESHI: Yes, I'm hoping.

10:09:58 22 THE COURT: Give or take.

10:09:59 23 MR. QURESHI: Give or take.

10:10:00 24 THE COURT: Let's take our recess, then.

10:10:01 25 MR. CASSONE: Thank you, Your Honor.

Massie - cross

10:10:05 1

COURT CLERK: All rise.

10:10:07 2

(A brief recess was taken.)

10:26:55 3

COURT CLERK: All rise.

10:26:57 4

THE COURT: The jury will be out directly.

10:27:07 5

(Jury entering the courtroom at 10:27 a.m.)

10:27:20 6

THE COURT: Please be seated, ladies and

10:27:23 7

gentlemen.

10:27:23 8

Dr. Massie, if you would come back to the

10:27:27 9

witness stand. And again I'll remind you that you are under

10:27:31 10

oath. And just be careful walking up to the stairs coming

10:27:38 11

down.

10:27:40 12

THE WITNESS: Thank you, Your Honor.

10:27:43 13

THE COURT: You may continue, counsel.

10:27:45 14

MR. QURESHI: Thank you, Your Honor.

10:27:46 15

BY MR. QURESHI:

10:27:50 16

Q. Are you ready, Dr. Massie?

10:27:52 17

A. Yes, sir.

10:27:52 18

Q. Yesterday during your direct examination, you talked

10:27:55 19

about correspondence between Osseo and Planmeca before Osseo

10:28:00 20

filed its lawsuit, correct?

10:28:02 21

A. Say that again, please.

10:28:03 22

Q. Yesterday you were asked questions by your attorney

10:28:06 23

about correspondence that was sent between Planmeca and

10:28:10 24

Osseo before Osseo filed its lawsuit, correct?

10:28:12 25

A. Correct.

10:28:13 1 Q. Are you familiar with all the correspondence that was
10:28:16 2 sent between Osseo and Planmeca before Osseo filed its
10:28:21 3 lawsuit?

10:28:22 4 A. I faintly recollect some of that.

10:28:26 5 Q. Now, you know that Osseo is accusing Planmeca of
10:28:29 6 having intentionally infringed your patents; correct?

10:28:33 7 A. Correct.

10:28:33 8 Q. And you would agree that it's important for the jury
10:28:36 9 to hear about all the correspondence that was sent between
10:28:40 10 Planmeca and Osseo before Osseo filed the lawsuit, right?

10:28:45 11 A. Sure.

10:28:46 12 Q. Now, yesterday you showed the jury only two letters
10:28:50 13 that were sent between Osseo and Planmeca. Correct?

10:28:53 14 A. Correct.

10:28:54 15 Q. And that was Mr. Rowan's October 2009 letter;
10:29:00 16 correct?

10:29:01 17 A. Correct.

10:29:01 18 Q. And Mr. Ostrow's May 2017 letter; correct?

10:29:05 19 A. Correct.

10:29:06 20 Q. Are you aware of any other correspondence between
10:29:08 21 Osseo and Planmeca before Osseo filed its lawsuit?

10:29:15 22 A. I don't recall.

10:29:21 23 Q. Let's look at your binder that was given to you
10:29:25 24 yesterday by your counsel, the white binder. And that's --
10:29:29 25 if we can go to tab L which has PX-37 which has been

10:29:35 1 admitted. If we can put that up, Mr. Herndon.

10:29:43 2 So this is the letter you showed the jury
10:29:49 3 yesterday, correct?

10:29:50 4 A. Correct.

10:29:51 5 Q. This is the first letter that Osseo sent to Planmeca
10:29:55 6 noticing Planmeca of some of your patents; correct?

10:30:02 7 A. From the legal team, yes.

10:30:04 8 Q. And this was sent with your authority; correct?

10:30:08 9 A. Correct.

10:30:09 10 Q. And it's from a law firm named Nixon & Vanderhyde
10:30:14 11 from somebody named Robert Rowan, shown on the next page,
10:30:18 12 your attorney that sent this letter. That was your
10:30:21 13 attorney, right, Bob Rowan?

10:30:24 14 A. Correct.

10:30:25 15 Q. It was sent to Planmeca OY, which I assume you know
10:30:28 16 is the Finland headquarters of Planmeca, correct?

10:30:31 17 A. Yes.

10:30:31 18 Q. And it was sent to Planmeca USA, which is the U.S.
10:30:34 19 daughter company, correct?

10:30:37 20 A. Correct.

10:30:38 21 Q. Now, if we can go to the body of the letter, the
10:30:41 22 first paragraph. This letter is putting -- is telling
10:30:44 23 Planmeca about the '301 and '262 patents, right?

10:30:52 24 A. Correct.

10:30:52 25 Q. Now, can we go to the second paragraph. And in the

10:30:58 1 second paragraph of Osseo's letter here, you're telling
10:31:03 2 Planmeca that Planmeca's ProMax 3D and Romexis software
10:31:09 3 appears to use the technology that's covered by the '301 and
10:31:13 4 '262 patents. Correct?

10:31:14 5 A. Correct.

10:31:16 6 Q. Now, you are not able to testify as to what Osseo
10:31:22 7 itself had done about investigating Planmeca's products at
10:31:28 8 that time; correct?

10:31:29 9 A. Other than what the legal firm had done for us.

10:31:32 10 Q. Okay. You personally did not do any investigation of
10:31:36 11 Planmeca's product, correct?

10:31:37 12 A. That's correct.

10:31:38 13 Q. You cannot speak to the purpose of this letter?

10:31:42 14 A. I think it was just to start a dialogue and let them
10:31:46 15 know that we existed.

10:31:51 16 Q. Okay. Does this letter say anything to Planmeca
10:31:54 17 about Planmeca's use of Hounsfield Units?

10:32:03 18 A. If you'll give me a minute to read the letter, I'll
10:32:04 19 let you know.

10:32:05 20 (Witness reviewing document.)

10:32:22 21 Q. There is no mention of Hounsfield Units, right?

10:32:24 22 A. Correct. Yeah, I don't believe so, to answer to your
10:32:26 23 question.

10:32:30 24 Q. Thank you. We can take that down, Mr. Herndon. If
10:32:32 25 we go to tab M of the binder that your attorney gave you

10:32:38 1 yesterday?

10:32:38 2 A. N as in Nancy or M.

10:32:41 3 Q. M as in Mary and that's PX-45. This was in your
10:32:47 4 binder, this is a document that your attorney gave you. Are
10:32:51 5 you familiar with this document?

10:32:59 6 A. Yes.

10:33:01 7 Q. Now, you didn't show this to the jury yesterday
10:33:04 8 during your direct examination, right?

10:33:08 9 A. I don't recall if they did or not.

10:33:12 10 MR. QURESHI: Your Honor, I offer PX-45 into
10:33:15 11 evidence. He said it was a document he is familiar with.

10:33:18 12 THE COURT: Any objection?

10:33:21 13 MR. OSTROW: No objection.

10:33:21 14 THE COURT: 45 is received.

10:33:23 15 MR. QURESHI: Thank you, Your Honor.

10:33:24 16 (PX Exhibit No. 45 was admitted into evidence.)

10:33:25 17 BY MR. QURESHI:

10:33:26 18 Q. So this is the letter from Juha Tawast, do you see
10:33:31 19 that?

10:33:32 20 A. Yes.

10:33:32 21 Q. You know he's from Planmeca OY, in Finland?

10:33:32 22 A. Correct.

10:33:32 23 Q. This is in Finnish, but that's dated November 5,
10:33:42 24 2009? Planmeca sends a letter to RAR at Nixonvan.com,
10:33:52 25 that's your attorney, Robert Rowan, right?

10:34:01 1 A. Correct.

10:34:02 2 Q. In that letter, if we can go to the body of the
10:34:07 3 letter, he wrote that he got Mr. Rowan's October 6th, 2000
10:34:17 4 letter that was addressed to Planmeca OY, and then he says
10:34:21 5 in the second sentence, and I'll read this. "We have
10:34:24 6 reviewed the patents and understand that they relate to
10:34:29 7 using dental and orthopedic patient densitometry models.
10:34:34 8 Currently, Planmeca is not involved in, nor do we have any
10:34:38 9 short term plans at least for going into such
10:34:44 10 applications-in view of which we find you referring to some
10:34:46 11 of our products somewhat confusing."

10:34:50 12 And then he goes on to say, "on the other hand,
10:34:54 13 as implementing CT densitometry dates decades back, should
10:34:59 14 we some time in the future decide to introduce any
10:35:02 15 applications relating to dental and orthopedic patient
10:35:06 16 densitometry modeling, we'd most probably adopt some
10:35:11 17 well-known and established prior art technology."

10:35:13 18 That's what he wrote to Osseo, correct?

10:35:16 19 A. Correct.

10:35:19 20 Q. And he had this asterisk here where he was talking
10:35:22 21 about CT densitometry dating back decades. If you go down
10:35:25 22 in this letter, here is what the asterisks are. There is
10:35:32 23 one more, if you can go down a little further. There is two
10:35:36 24 articles, the Exner and Elsasser article right, he cited
10:35:42 25 those to Osseo right?

10:35:49 1 Can we go to the last line of what Mr. Tawast
10:35:54 2 said. And Planmeca said "we thank Dr. Massie and Dr. Leslie
10:36:04 3 for their offer, but do not consider their patents
10:36:08 4 interesting to Planmeca at this time." Correct?
10:36:11 5 A. Correct.
10:36:11 6 Q. So you understood that Planmeca was not interested in
10:36:15 7 taking a license or developing your patents, correct?
10:36:17 8 A. At that time.
10:36:18 9 Q. Now, those two references that Mr. Tawast identified
10:36:24 10 for you, the Exner and Elsasser articles, you don't recall
10:36:29 11 having reviewed those references, correct?
10:36:31 12 A. No.
10:36:32 13 Q. We can take that down.
10:36:37 14 Now, Mr. Tawast's letter that we just looked at,
10:36:42 15 was that communicated to your patent attorney, Mark Brown?
10:36:47 16 A. I have no idea.
10:36:48 17 Q. You have no idea. Can we put up JX-3, please.
10:36:56 18 And --
10:36:57 19 A. I know we tried to communicate everything that we
10:37:00 20 could, it was requested, but specifically that, I have no
10:37:03 21 idea.
10:37:03 22 Q. Let me see if I can refresh your memory. If we go to
10:37:07 23 the bottom right where it says continued, right there. And
10:37:12 24 highlight the attorney, agent or firm part. This is the
10:37:12 25 '374 patent and the attorney who handled this for you at the

10:37:20 1 Law Office of Mark Brown, which I assume is the Mark Brown
10:37:24 2 you have been talking about?

10:37:25 3 A. That's correct.

10:37:26 4 Q. And then Mr. Herndon, if could go to the documents
10:37:30 5 cited. The documents cited section. Right there. Right
10:37:43 6 there. Do you see where it says other publications? Do you
10:37:48 7 see the Elsasser and Exner paper cited right toward the
10:37:55 8 middle?

10:37:59 9 A. I see a citation, I'm assuming that is that article.

10:38:02 10 Q. So these are the two articles that Planmeca cited to
10:38:05 11 you in the November 2009 letter, and now they have been
10:38:10 12 cited in the history of the '374 patent, right?

10:38:15 13 A. Correct.

10:38:16 14 Q. You don't remember if Mr. Tawast's letter was
10:38:20 15 communicated to Mark Brown?

10:38:21 16 A. I have no idea.

10:38:21 17 Q. Do you know if Mr. Rowan communicated to Mark Brown?

10:38:26 18 A. I have no idea.

10:38:27 19 Q. Remind us why Mr. Rowan stopped representing you?

10:38:30 20 A. At the time, he and his partner were in the middle of
10:38:34 21 a major elongating litigation, as well as Mr. Rowan was in
10:38:40 22 the middle of some personal problems, divorce and his
10:38:44 23 personal life. He was having some early health problems and
10:38:48 24 then his partner actually had to take an early medical
10:38:52 25 retirement.

10:38:54 1 Q. And so they had to let you go as a client?

10:38:57 2 A. Correct.

10:39:02 3 Q. Now if could go to the blue binder, the one I gave
10:39:06 4 you. Go to Tab 21, JX-14. Have you seen this letter, or
10:39:19 5 this document?

10:39:27 6 A. Yes.

10:39:28 7 Q. Okay.

10:39:30 8 MR. QURESHI: Your Honor, I offer JX-14 into
10:39:33 9 evidence.

10:39:34 10 THE COURT: Any objection to JX-14?

10:39:38 11 MR. OSTROW: No objection.

10:39:39 12 THE COURT: JX-14 is received.

10:39:42 13 (JX Exhibit No. 14 was admitted into evidence.)

10:39:44 14 BY MR. QURESHI:

10:39:45 15 Q. So this is the letter that Mr. Rowan sent back to
10:39:49 16 Planmeca, Mr. Tawast's, dated March 9, 2010, right?

10:39:54 17 A. Correct.

10:39:55 18 Q. And he is basically responding to Mr. Tawast's e-mail
10:40:00 19 that we looked at a moment ago, right?

10:40:02 20 A. Yes.

10:40:02 21 Q. This letter is about the '301 and '262 patents,
10:40:05 22 correct?

10:40:06 23 A. Correct.

10:40:06 24 Q. Now, in this letter, he included some claim charts;
10:40:11 25 right?

10:40:13 1 A. Yes.

10:40:14 2 Q. Do you know what claim charts are, Dr. Massie?

10:40:17 3 A. In a very limited way.

10:40:19 4 Q. Okay. And tell me if what I say is not your
10:40:22 5 understanding. Claim charts are basically a way to map the
10:40:25 6 elements of a claim against a product that is allegedly
10:40:28 7 infringing those elements?

10:40:29 8 A. That's about all I understand.

10:40:31 9 Q. Now, if we look at the -- if we scroll down to the
10:40:34 10 first page of the claim chart and let me see if you and I
10:40:43 11 can help orient the jury. This is the claim chart on the
10:40:47 12 '301 patent, page 4 of JX-14. It says page 1, but the trial
10:40:54 13 exhibit is page 4. Do you have that in front of you?

10:40:58 14 A. Yes.

10:40:58 15 Q. And so on the left side in claim one and all the
10:41:03 16 elements of claim one we looked at a little earlier today.
10:41:06 17 And in the second column is a column for Planmeca ProMax 3D
10:41:11 18 with Romexis, which is Mr. Rowan's explanation of why he
10:41:18 19 thinks Planmeca's product meets the limitation of the claim;
10:41:22 20 correct?

10:41:22 21 A. Correct.

10:41:23 22 Q. And if you go down, Mr. Herndon, there is also a
10:41:27 23 claim chart for the '262 patent that begins at page 13 of
10:41:35 24 this trial exhibit.

10:41:42 25 And so in his claim chart he also included a

10:41:50 1 mapping for the '262 patent, claim one. Do you see that?

10:41:53 2 A. I'm looking for it. I see it there. I do not have a
10:42:10 3 copy. My copy ends on page 12 of 12.

10:42:13 4 Q. Yes. But so -- look at page 10 of 12 then, you're
10:42:18 5 looking at a different page number.

10:42:20 6 A. Okay.

10:42:21 7 Q. So if you go to page 10 of 12.

10:42:24 8 A. I see it.

10:42:25 9 Q. You see it?

10:42:26 10 A. I do.

10:42:26 11 Q. So there is a claim chart for claim one of the '301
10:42:31 12 patent and there is a claim chart for claim one of the '262
10:42:34 13 patent, right?

10:42:35 14 A. Right.

10:42:35 15 Q. Now in that second column where Mr. Rowan is
10:42:39 16 explaining why he thinks Planmeca's products infringe, he
10:42:42 17 never mentioned Planmeca's use of Hounsfield Units, does he?

10:42:51 18 A. No, I don't see any reference there.

10:43:00 19 Q. Okay. And you don't recall personally performing any
10:43:04 20 investigation relating to this letter and its contents,
10:43:07 21 right?

10:43:07 22 A. No.

10:43:12 23 Q. Now, if we can turn to your binder from yesterday,
10:43:16 24 the white one. If we go to tab N, as in Nancy.

10:43:22 25 A. Tab?

10:43:25 1 Q. N, N as in Nancy. The white binder. Yes?

10:43:30 2 A. I don't have tabs, they're numerical. I mean,
10:43:37 3 they're not numerical, they're alphabetical.

10:43:41 4 Q. Yes, N as in Nancy?

10:43:43 5 A. N as in Nancy, I thought you said ten, counsel.

10:43:48 6 Q. And that's P-366 that was admitted and you answered
10:43:54 7 some questions about yesterday. Do you see that?

10:43:56 8 A. Correct.

10:43:56 9 Q. And that's Mr. -- 366, P-366. And that was a letter
10:44:06 10 sent by Mr. Ostrow, your attorney, dated May 30th, 2017,
10:44:11 11 right?

10:44:12 12 A. Correct.

10:44:13 13 Q. Now, in this letter, we go to the first paragraph, he
10:44:21 14 is adding the '374 patent. Right?

10:44:21 15 A. Yes.

10:44:28 16 Q. Okay. So the initial letter that Mr. Rowan sent were
10:44:34 17 about the '301 and '262 patents, and this letter that
10:44:37 18 Mr. Ostrow sent in May 2017 is adding the '374 patent,
10:44:41 19 correct?

10:44:42 20 A. Correct.

10:44:42 21 Q. You're not aware of any communications between
10:44:42 22 Mr. Rowan's 2010 letter with claim charts and Mr. Ostrow
10:44:52 23 May 2017 letter; correct?

10:44:54 24 A. Correct.

10:44:54 25 Q. And why was there such a long period of time between

10:44:59 1 those letters?

10:45:00 2 A. In the middle of all that we were working on
10:45:04 3 expanding the company, applying for more patents in Europe
10:45:09 4 also, as well as in Canada. We were seeking funding and
10:45:15 5 establishing normal business operations for our business.

10:45:18 6 Q. Are you aware of --

10:45:20 7 A. And I was also running a dental practice, chairman of
10:45:24 8 the board of my YMCA, involved in various other civic
10:45:30 9 activities, my life was pretty full.

10:45:32 10 Q. If you can go to your deposition transcript which is
10:45:36 11 the first document in the blue binder. Do you have that?

10:45:41 12 A. Yes.

10:45:45 13 Q. This is the deposition transcript you said yesterday
10:45:47 14 that you have reviewed and signed?

10:45:50 15 A. Yes.

10:45:51 16 Q. If you can turn to page 96, line 18. Are you there?

10:46:18 17 A. Yes.

10:46:32 18 Q. Ms. Peschel asked you why was there such a long
10:46:36 19 period of time in between these two letters? And after an
10:46:40 20 objection from your attorney, you answered, "I am going to
10:46:42 21 take counsel's advice not to answer that." Did I read that
10:46:50 22 correctly?

10:46:50 23 A. Yes.

10:46:55 24 Q. Now, if we can put up, Mr. Ostrow's May 2017 letter
10:47:00 25 again, which is P-366. Now, in this letter, Mr. Ostrow

10:47:18 1 included a claim chart for the '374 patent; right? You can
10:47:22 2 scroll down Mr. Herndon, so the jury can see the claim chart
10:47:26 3 that is attached. Similar to what Mr. Rowan did for the
10:47:30 4 '301 and '262 patents in 2010, Mr. Ostrow provided a claim
10:47:34 5 chart for the claims of the '374 patent, correct?

10:47:37 6 A. Correct.

10:47:39 7 Q. And he included a column where he's talking about why
10:47:42 8 he thinks Planmeca's ProMax 3D products infringe the claims
10:47:47 9 of the '374 patent, correct?

10:47:50 10 A. Correct.

10:47:50 11 Q. Nowhere in Mr. Ostrow's letter or this claim chart
10:47:54 12 does it mention Planmeca's use of Hounsfield Units, does it?

10:47:54 13 A. Not that I am aware of.

10:48:00 14 Q. If we can go to Tab 23 of the blue binder. Are you
10:48:20 15 familiar with the document at Tab 23, Dr. Massie?

10:48:40 16 A. Yes.

10:48:45 17 Q. Okay.

10:48:46 18 MR. QURESHI: Your Honor, I offer JX-16 into
10:48:49 19 evidence.

10:48:50 20 THE COURT: Any objection to 16?

10:49:00 21 MR. OSTROW: May we have a moment, Your Honor?

10:49:03 22 THE COURT: Yes, you may.

10:49:20 23 MR. OSTROW: No objection.

10:49:27 24 THE COURT: All right. JX-16 is received.

10:49:30 25 (JX Exhibit No. 16 was admitted into evidence.)

Massie - cross

MR. QURESHI: Thank you.

BY MR. QURESHI:

Q. Dr. Massie, JX-16 is an e-mail chain; correct?

A. Yes.

Q. And it's between Mr. Ostrow and Juha Tawast of Planmeca, right?

A. Yes.

Q. Now, you didn't mention this document in your direct examination yesterday; correct?

A. Correct.

Q. So here is the first e-mail in the chain from Mr. Tawast dated June 21, 2017, to Mr. Ostrow. Do you see that?

A. Yes.

Q. And in the second paragraph he tells, Mr. Tawast tells Mr. Ostrow, you may not be aware that in 2009 Planmeca received a letter from Osseo dated October 6, 2009. Do you see that?

A. Uh-huh.

Q. So Mr. Tawast is saying because he's getting a letter from a new attorney that maybe Mr. Ostrow wasn't aware of the prior correspondence with Mr. Rowan, right?

A. Correct.

Q. And Mr. Tawast says in this paragraph, reminding Mr. Ostrow that Planmeca declined the previous offer and

10:50:52 1 says nothing has changed since then. Planmeca is unable to
10:50:58 2 recognize a single Osseo patent claim which would validly
10:51:02 3 cover any Planmeca product. Correct?

10:51:04 4 A. Yes.

10:51:05 5 Q. So he's basically saying that his analysis of Osseo's
10:51:09 6 patents has not changed since that earlier correspondence in
10:51:12 7 2009, right?

10:51:13 8 A. That's what it appears.

10:51:15 9 Q. Can we go to the next e-mail in the chain,
10:51:20 10 Mr. Herndon.

10:51:21 11 So Mr. Ostrow responds, and that's August 25th,
10:51:28 12 it's in Finnish, August 25, 2017, to Mr. Tawast. And he
10:51:34 13 says in the second paragraph, "the letter we sent this year,
10:51:41 14 meaning 2017, raises new issues not previously discussed by
10:51:48 15 the parties. In particular, we are raising issues regarding
10:51:53 16 a new patent, the '374 patent, which issued in 2013 and
10:51:59 17 therefore was not the subject of the prior correspondence.

10:52:03 18 Do you see that?

10:52:03 19 A. Yes.

10:52:04 20 Q. So he's basically saying the '374 patent was issued
10:52:07 21 in 2013 so we couldn't have been talking about it in 2009,
10:52:13 22 right?

10:52:13 23 A. Correct.

10:52:14 24 Q. And in this letter, or this e-mail from Mr. Ostrow,
10:52:20 25 he never disagrees with Mr. Tawast's position from before

10:52:26 1 that Planmeca doesn't do densitometry; right?

10:52:30 2 A. There was nothing mentioned about that.

10:52:33 3 Q. There is nothing mentioned about that. That's fine.

10:52:36 4 And later on in that e-mail -- I'm sorry, and

10:52:44 5 there is no mention of Hounsfield Units in Mr. Ostrow's

10:52:49 6 August 25, 2017 response back to Mr. Tawast, right?

10:52:58 7 A. Correct.

10:52:59 8 Q. Okay. Now, this lawsuit was filed I believe

10:53:03 9 October 3rd, 2017; right?

10:53:05 10 A. Correct.

10:53:06 11 Q. Can we go to the most recent e-mail, the top one. So

10:53:11 12 Mr. Tawast of Planmeca, on October 27, 2017, sends another

10:53:21 13 e-mail to Mr. Ostrow. So this is after Osseo had filed a

10:53:27 14 lawsuit, right?

10:53:28 15 A. Yes.

10:53:29 16 Q. And if we can go to the body, Mr. Tawast is again

10:53:41 17 saying that no Planmeca product performs densitometry;

10:53:52 18 right?

10:53:59 19 A. State that -- make that statement again.

10:54:02 20 Q. Mr. Tawast is saying that Planmeca has no product

10:54:05 21 that infringed your Osseo patents, right?

10:54:09 22 A. That's what he said all along.

10:54:12 23 Q. Okay. And he also raised, in this paragraph he says

10:54:17 24 in case your position is interesting, he's Finnish, his

10:54:22 25 English is a little broken, he has a discussion here about

10:54:30 1 Godfrey Hounsfield, the person who came up with the
10:54:36 2 Hounsfield Unit scale, do you see that?

10:54:37 3 A. Yes.

10:54:37 4 Q. And Mr. Tawast says there just is no way for any
10:54:42 5 Planmeca product infringing any valid claim of the Osseo
10:54:45 6 patents. Right?

10:55:05 7 A. I don't think he used that exact verbiage, but I
10:55:09 8 think the over tone is still there.

10:55:10 9 Q. The what is still there?

10:55:12 10 A. The over tone is still there.

10:55:13 11 Q. I just have a few more questions.

10:55:14 12 Dr. Massie, you're not aware of any facts
10:55:19 13 regarding commercial success by others that relate to the
10:55:21 14 nonobviousness of your patents?

10:55:24 15 A. That's a legal question.

10:55:26 16 Q. Okay. You answered it during your deposition. You
10:55:29 17 don't remember -- do I need to show your deposition
10:55:31 18 transcript?

10:55:32 19 A. I am not aware of any other claim.

10:55:34 20 Q. Do you need me to refresh your memory with your
10:55:38 21 deposition?

10:55:39 22 A. Yes.

10:55:39 23 Q. If you could go to your deposition transcript,
10:55:50 24 page 163?

10:55:52 25 A. That was tab number.

10:55:59 1 Q. That was the first document in the blue binder.

10:56:02 2 A. Yes. Yes. I'm sorry. And the page was?

10:56:10 3 Q. Page 163, line 16. Do you have that in front of you?

10:56:32 4 Page 163 line 16?

10:56:34 5 A. 153.

10:56:36 6 Q. 163?

10:56:37 7 A. 163, sorry. Line?

10:56:40 8 Q. 16. I'm sorry, yeah, line 16, 1, 6. If you read
10:56:47 9 your -- the question and answer there, does that refresh
10:56:50 10 your memory as to the answer to my question?

10:56:52 11 A. I said no.

10:56:54 12 Q. You said no.

10:56:55 13 And Dr. Massie, you are not able to provide any
10:56:59 14 evidence of copying the invention disclosed in the '301
10:57:05 15 patent; correct?

10:57:07 16 A. Correct.

10:57:07 17 Q. And you are not able to provide any evidence of
10:57:10 18 copying of the invention disclosed in the '262 patent,
10:57:14 19 correct?

10:57:15 20 A. Correct.

10:57:16 21 Q. And you are not able to provide any evidence of
10:57:19 22 copying of the invention disclosed in the '374 patent;
10:57:22 23 correct?

10:57:24 24 A. That's correct.

10:57:25 25 MR. QURESHI: Thank you, Doctor.

Massie - redirect

THE COURT: Redirect, counsel?

MR. OSTROW: Yes, Your Honor.

REDIRECT EXAMINATION

BY MR. OSTROW:

Q. So again, Dr. Massie, I'm going to show you something that you were just looking at when Mr. Qureshi was asking you questions, in particular about the e-mail that you sent back to Planmeca, do you see that?

A. Good morning. Yes.

Q. We haven't spoken, so Good Morning.

A. We have not.

Q. How was your night?

A. It was good. And you?

Q. Yes. Fine, thank you.

So Mr. Qureshi asked you if I, Mr. Ostrow, expressed disagreement with any of the positions that Planmeca had taken. Do you remember that?

A. Yes.

Q. And in fact I did, right, it says in addition we continue to disagree with Planmeca's positions as to the previously discussed patents, and insist that Planmeca does indeed require a license. Do you see that?

A. Yes.

Q. So I did disagree, right?

A. Yes.

10:58:49 1 Q. Let's go to the first page of the document. So
10:58:53 2 Mr. Qureshi walked you through some discussion about
10:58:57 3 Mr. Hounsfield, Doctor Hounsfield and sort of in the middle
10:59:01 4 of the e-mail and Mr. Qureshi had asked you some questions
10:59:06 5 about the claim charts that I had sent or that the previous
10:59:10 6 lawyer had sent. Do you recall that?

10:59:11 7 A. Yes.

10:59:11 8 Q. And asked you whether they explicitly discussed
10:59:16 9 Hounsfield Units, do you remember that?

10:59:17 10 A. Yes.

10:59:17 11 Q. And you, after reviewing it, you didn't see it
10:59:22 12 mentioned, so you said no, correct?

10:59:24 13 A. Right.

10:59:25 14 Q. But in fact somehow Planmeca got the information
10:59:28 15 because they're discussing Hounsfield and Hounsfield Units?

10:59:31 16 A. In that e-mail, yes.

10:59:34 17 Q. Okay. Pull up again a document that's behind Tab 21
11:00:00 18 in the book. Exhibit P-17. Can you go to the third page of
11:00:40 19 the document, please.

11:00:42 20 So, Mr. Qureshi asked you questions about claim
11:00:42 21 charts that were submitted by prior counsel, Bob Rowan. And
11:00:50 22 again, the question was about what was disclosed in the
11:00:52 23 claim charts. Do you remember that?

11:01:01 24 A. Yes.

11:01:02 25 Q. Do you know that there are footnotes on this page?

11:01:04 1 Do you see that?

11:01:05 2 A. Yes.

11:01:05 3 Q. And do you see the first footnote references a

11:01:09 4 Planmeca.com document that was downloaded with a URL. Do

11:01:14 5 you see that?

11:01:14 6 A. Yes.

11:01:14 7 Q. Actually two of them, right?

11:01:17 8 A. Correct.

11:01:18 9 Q. Do you know whether those documents discussed

11:01:21 10 Hounsfield Units?

11:01:23 11 A. I don't know.

11:01:24 12 Q. But they could have?

11:01:25 13 A. They could.

11:01:29 14 Q. And just to save the time, I can't find them right

11:01:34 15 now, the claim charts that I had sent, do you recall when

11:01:37 16 those were shown to you that those had URL's in them as

11:01:42 17 well, referring to documents?

11:01:44 18 A. I'm sure they did.

11:01:46 19 Q. Did you look at those documents to respond to

11:01:49 20 Mr. Qureshi's question about Hounsfield Units?

11:01:53 21 A. I did not.

11:02:00 22 Q. Do you recall yesterday Mr. Qureshi asked you about

11:02:12 23 the letter you had sent to Dr. Christensen?

11:02:18 24 A. Yes.

11:02:19 25 Q. In the letter you discussed the idea of getting

11:02:22 1 densitometry information, do you remember that?

11:02:23 2 A. Yes.

11:02:23 3 Q. Was it your intent in that letter to describe your
11:02:27 4 entire invention?

11:02:28 5 A. No, I was still fact finding, I was still looking for
11:02:31 6 different ways to accomplish the goal that I needed
11:02:34 7 clinically, that Dr. Christensen had brought up.

11:02:38 8 Q. And that letter was sent after you filed your patent
11:02:41 9 application?

11:02:42 10 A. Correct.

11:02:47 11 Q. DDX-118. Do you recall Mr. Qureshi spent some time
11:02:55 12 asking you questions about whether you invented particular
11:02:58 13 elements from your claims. Do you remember that?

11:03:00 14 A. Say it again.

11:03:00 15 Q. Do you recall Mr. Qureshi spent a fair amount of time
11:03:04 16 asking you questions about whether you invented specific
11:03:07 17 elements in your claims, do you remember that?

11:03:08 18 A. I remember that conversation.

11:03:10 19 Q. Like an input device, and a micro processor?

11:03:14 20 A. Yes.

11:03:14 21 Q. You were here yesterday during Planmeca's opening
11:03:17 22 arguments, yes?

11:03:18 23 A. Yes.

11:03:18 24 Q. Do you remember they put up this slide showing a
11:03:22 25 hypothetical patent for a soccer ball, do you remember this?

11:03:25 1 A. Yes.

11:03:25 2 Q. And that the patent is on a ball that comprising,
11:03:30 3 made of leather, stitched together, filled with compressed
11:03:34 4 air, and round. Do you see that, I understand this is a
11:03:36 5 hypothetical?

11:03:37 6 A. Yes.

11:03:38 7 Q. Is it your understanding that whoever invented this
11:03:41 8 would have had to have invented leather?

11:03:45 9 A. No.

11:03:46 10 Q. So they didn't have to invent leather itself?

11:03:49 11 A. No.

11:03:49 12 Q. How about stitching, did they have to invent
11:03:52 13 stitching?

11:03:53 14 A. No.

11:03:53 15 Q. Did they have to invent compressed air?

11:03:56 16 A. No.

11:03:57 17 Q. Okay. Did they have to invent use of a round ball?

11:04:02 18 A. No.

11:04:02 19 Q. So do you have an understanding as to the invention
11:04:06 20 here being the combination of all those things resulting in
11:04:09 21 this hypothetical soccer ball, right?

11:04:11 22 A. Yes.

11:04:12 23 Q. Similarly with your patents, do you have an
11:04:15 24 understanding as to whether you needed to be the inventor of
11:04:18 25 input devices and microprocessors and x-ray machines, do you

11:04:22 1 have an understanding?

11:04:23 2 A. I didn't need to do that.

11:04:25 3 Q. You understand whether your patent is the combination
11:04:29 4 of those things to generate a system for tomographically
11:04:33 5 modeling densitometry data?

11:04:35 6 A. Yes.

11:04:35 7 Q. Are you the inventor of that?

11:04:38 8 A. Yes.

11:04:38 9 Q. During the time period that's been discussed in which
11:04:41 10 you approached various companies to work with you, can you
11:04:45 11 describe sort of the nature of your life at that time, and
11:04:50 12 I'm specifically asking, let's break it down. You were
11:04:55 13 working as a dentist at the time, correct?

11:04:57 14 A. Full-time.

11:04:58 15 Q. Full-time. What does that mean?

11:05:01 16 A. Well full-time in my practice because I'm also the on
11:05:04 17 call, the only on call dentist at my local hospital, so it
11:05:08 18 could be anywhere from 50, 60, 70 hours a week, easily 35 to
11:05:15 19 45 hours in my practice, but then being available as the on
11:05:19 20 call, the only on call provider in the area.

11:05:22 21 Q. Why were you the only on call provider in the area?

11:05:24 22 A. It's very, very difficult to become certified in a
11:05:28 23 hospital environment as a dentist. One, there is not a big
11:05:32 24 need in most hospitals, in my hospital because it being
11:05:36 25 recreational, there is a lot of facial trauma, consequently

11:05:40 1 I have to be involved in taking care of very many people
11:05:43 2 with facial trauma. So there were many nights I didn't have
11:05:48 3 dinner.

11:05:48 4 Q. So, we're talking about the period of roughly 2000 to
11:05:51 5 2010, is that fair?

11:05:53 6 A. That's fair. I was also a new father.

11:05:56 7 Q. I was about to ask you about that.

11:05:59 8 A. Times two.

11:06:00 9 Q. What was your family life like at the time?

11:06:02 10 A. It was a great family life, but just very business
11:06:04 11 busy. My life was very busy, it was somewhat limited
11:06:10 12 between my practice, working on my patents and developing as
11:06:15 13 much as I could a business, i.e., Osseo Imaging.

11:06:19 14 Q. During that time period, did you have children?

11:06:22 15 A. Yes, I had two young daughters.

11:06:24 16 Q. And you were, of course are you a good dad?

11:06:30 17 A. Yes.

11:06:32 18 Q. So you were there for them, you spent time with them?

11:06:34 19 A. As much as I could, and once in a while sleep.

11:06:36 20 Q. It doesn't sound like there was much time for that
11:06:42 21 either?

11:06:42 22 A. There wasn't much time.

11:06:43 23 Q. During that time period given your dental practice,
11:06:46 24 your work at the hospital, and obviously your children,
11:06:50 25 realistically how much time could you spend trying to

develop your invention through Osseo?

A. Well, part of the limitation that I had was I live in a rural environment and my patent counsel was all the way in Kansas City. So in order to travel back and forth, communication was basically via e-mails, letters, and then several trips back and forth to meet with him in his offices in the Kansas City area. My time was pretty limited. In a nutshell.

MR. OSTROW: I'm good, Your Honor. No more questions.

THE COURT: Any recross.

MR. QURESHI: No sir.

THE COURT: You may step down, Doctor.

THE WITNESS: Thank you.

THE COURT: The plaintiff may call its next witness.

MR. OSTROW: It calls Dr. Omid Kia.

THE COURT: Doctor, if you will come -- not run into each other, with this doctor, stand here in front of my courtroom deputy, we're going to ask you some questions and then swear you in as a witness.

COURT CLERK: Please raise your right hand.
State and spell your name for the record.

THE WITNESS: My name Omid Kia, O-M-I-D, last name K-I-A.

Kia - direct

11:08:14 1 OMID KIA, having been duly sworn, was examined
11:08:20 2 and testified as follows:

11:08:26 3 THE COURT: Have a seat in the witness chair.

11:08:29 4 THE WITNESS: Yes, sir.

11:08:36 5 THE COURT: You may proceed, Mr. Ostrow.

11:08:40 6 MR. OSTROW: Thank you, Your Honor

11:08:41 7 DIRECT EXAMINATION

11:08:42 8 BY MR. OSTROW:

11:08:42 9 Q. Hello, Dr. Kia. Please introduce yourself to the
11:08:44 10 jury.

11:08:44 11 A. Good afternoon. Good morning actually. My name is
11:08:50 12 Dr. Omid Kia.

11:08:54 13 Q. Who do you currently work for, Dr. Kia?

11:08:57 14 A. I currently work for Coastal Communication
11:09:01 15 Consultants as a subject matter expert.

11:09:03 16 Q. And what kind of work does Coastal Communications do?

11:09:08 17 A. Coastal Communication Consultants is a government
11:09:12 18 contractor for the Department of Defense. Their specialty
11:09:17 19 is by placing highly educated people in research and
11:09:23 20 development labs within the U.S. government, primarily the
11:09:28 21 Department of Defense.

11:09:29 22 Q. What is your position at Coastal?

11:09:32 23 A. So my position is I am a senior systems engineer.
11:09:37 24 But that's just for within the company. Whenever there is a
11:09:42 25 contract and there is a match within my skills and what the

Kia - direct

11:09:44 1 government needs, so that title changes. And I have been
11:09:48 2 known to have titles such as chief scientist, chief
11:09:53 3 engineer, image scientist, data scientist, things of that
11:09:56 4 nature.

11:09:57 5 Q. Dr. Kia, at a high level, what are you here to
11:10:02 6 testify about today?

11:10:02 7 A. At a high level, I have been asked to provide opinion
11:10:07 8 about the patents-in-suit, about the products that Planmeca
11:10:13 9 manufacturers and sells, and the validity of those patents
11:10:18 10 and also certain damages, the value of the products.

11:10:24 11 Q. Dr. Kia, are you being compensated for your work?

11:10:28 12 A. Yes, sir, I'm being compensated on an hourly basis.

11:10:31 13 Q. Does your compensation in any way depend on the
11:10:34 14 outcome of this case?

11:10:38 15 A. No, sir, it does not.

11:10:39 16 Q. Did you prepare any demonstratives to assist the jury
11:10:42 17 with your testimony today?

11:10:43 18 A. Yes, sir, I have.

11:10:44 19 MR. OSTROW: Your Honor, at this time I would
11:10:47 20 like to bring up hard copies.

11:10:48 21 THE COURT: Yes, you may.

11:11:00 22 MR. OSTROW: Your Honor, I also would like to
11:11:03 23 approach to bring copies of the witness binders.

11:11:04 24 THE COURT: You may.

11:11:32 25 BY MR. OSTROW:

Kia - direct

11:11:40 1 Q. Dr. Kia, you have been handed some fairly large
11:11:43 2 binders, a lot of paper. Can you just look at the one
11:11:47 3 behind you, the document behind tab A of book one.

11:11:52 4 A. Yes, sir.

11:11:53 5 Q. Is the document there marked PX-390, what is that
11:12:01 6 document?

11:12:01 7 A. That's my curriculum vitae, my CV.

11:12:06 8 Q. As far as you know, is this an up-to-date version of
11:12:10 9 your CV?

11:12:15 10 A. I believe as of 2018 it is.

11:12:21 11 MR. OSTROW: Your Honor, I would like to move to
11:12:22 12 admit document PX-390 into evidence and publish it to the
11:12:25 13 jury.

11:12:26 14 THE COURT: Any objection.

11:12:27 15 MR. QURESHI: No objection.

11:12:28 16 THE COURT: PX-390 is received.

11:12:30 17 (PX Exhibit No. 390 was admitted into evidence.)

11:12:31 18 BY MR. OSTROW:

11:12:41 19 Q. Dr. Kia, let's walk through your educational
11:12:42 20 background. Can you start with your bachelors degree and
11:12:50 21 tell us what it is in?

11:12:52 22 A. Absolutely. So I received my bachelors in electrical
11:12:53 23 engineering from the Catholic University of Measuring.
11:13:01 24 While I was there, I did a lot of work, I have been working
11:13:04 25 as far as I can remember. But relative to some of the

Kia - direct

11:13:07 1 subject matter, I did research and development as an under
11:13:11 2 graduate in some of the labs in the University, in
11:13:14 3 mechanical engineering, civil engineering, biomedical
11:13:18 4 engineering, and part of my education I did a lot of
11:13:22 5 computer system to help divers whenever they dive under the
11:13:27 6 water to control their timing and how much air they have
11:13:30 7 left.

11:13:30 8 Q. And what did you do after getting your bachelors?

11:13:35 9 A. After receiving any bachelors, I went to University
11:13:38 10 of Illinois at Chicago, that's where I received my masters,
11:13:41 11 also in electrical engineering. The concentration there was
11:13:44 12 control theory, and just as an example, it is -- my thesis
11:13:47 13 was helicopter rotors, so if you don't control it, it
11:13:50 14 explodes, so you need to dampen it to make it respond. I
11:14:03 15 also worked in a number of research and development labs
11:14:06 16 while there, one of those things was studying the arterial
11:14:09 17 lobe of the heart to the signal processing through advanced
11:14:12 18 stages of heart disease.

11:14:15 19 Q. You mentioned something called control theory, can
11:14:18 20 you explain to us what that is?

11:14:21 21 A. Absolutely. It's a part of electrical engineering,
11:14:24 22 heavy, heavy in math. And the basis of it is how do you
11:14:27 23 control something that is otherwise would be uncontrollable,
11:14:30 24 like let's say you have a dome and you put a car on there,
11:14:33 25 the minute you let go of the car it rolls on and off, but

Kia - direct

11:14:40 1 you have some control there that if it rolls forward to push
11:14:44 2 it back a little bit, if it rolls back, push it forward,
11:14:47 3 something like that, that's actually an under graduate lab
11:14:51 4 for control theory that students have to do. So you put the
11:14:54 5 car back and forth, control the vehicle to be able to put it
11:14:58 6 right at the summit.

11:15:00 7 Q. All right. After your masters, did you continue on
11:15:04 8 in your education?

11:15:05 9 A. Absolutely. So going through my bachelor and
11:15:10 10 masters, it was very difficult, I had to work a lot. But
11:15:13 11 with that, I finished with a straight A GPA, and I had to do
11:15:18 12 my Ph.D., there was just no other way. So I enrolled at the
11:15:21 13 University of Maryland, I got a full-time job and I finished
11:15:24 14 my Ph.D. in electrical engineering as well at the University
11:15:30 15 of Maryland. And in that, there was a number of tracks to
11:15:34 16 follow, control theory and communication theory, but most of
11:15:41 17 my concentration I decided on this back at masters is that I
11:15:45 18 wanted to do image processing.

11:15:47 19 So image processing by itself was very easy, so
11:15:51 20 when I went to University of Maryland I was introduced to a
11:15:55 21 lot of different aspects of image processing, in particular
11:15:58 22 image understanding. So things like detecting things in
11:16:02 23 images or playing around with what I can do with images,
11:16:07 24 bring one to the other, which is computational imaging, make
11:16:12 25 an image from other images. Try to maybe do three

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11:16:17 1 dimensions where you take images from different directions
11:16:20 2 and make a 3D model out of it because you kind of know how
11:16:24 3 things shift as you look at it from different angles. So I
11:16:28 4 was really interested in that and that continued to feed a
11:16:32 5 lot of my interests going forward.

11:16:35 6 Q. When did you get your Ph.D. in electrical
11:16:38 7 engineering?

11:16:38 8 A. That was in 1997.

11:16:42 9 Q. What did you do after getting your Ph.D.?

11:16:45 10 A. So I worked in a number of places, all at research
11:16:51 11 and development, immediately after I went to the National
11:16:54 12 Institute of Standards and Technology, also in Maryland and
11:16:59 13 continued with the research topic. But more so I went
11:17:03 14 forward and developed a number of medical imaging products
11:17:10 15 and researched in that area as well.

11:17:13 16 Q. What kind of medical imaging products did you work
11:17:16 17 on?

11:17:16 18 A. So from fluoroscopy, radiography, cinematography,
11:17:21 19 tomosynthesis, and later on at Imaging Sciences, I did a CT
11:17:30 20 for dental applications.

11:17:32 21 Q. Let's talk about the Imaging Sciences a little more,
11:17:40 22 what was your position at Imaging Sciences?

11:17:42 23 A. I was hired as the chief scientist at Imaging
11:17:50 24 Sciences. I was their first digital higher and with my
11:17:52 25 experience working on a detector called variant panel,

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variant is the manufacturer of it, but since I had experience with that, they were interested in using that, it was a very good fit. I also had a lot of experience working with imaging intensifiers which put an x-ray in and an image intensifier can capture the image. So they knew as a detector perspective, I knew what I was talking about.

Q. You mentioned Varian detector, what is that?

A. So at the time somewhere late '90s, Varian developed this technology to detect x-rays without the need of a tube, a large tube in the back. What they did is that they took a very flat piece of glass, put silicone on it, in a sense a large plate became the detector, when the x-ray hits it, each one of the elements that was on the detector would capture the energy, would capture the electrons, the electronics would read it out and form an image out of that. So they used that in cardiology. If you have a heart problem, you know, you lie on a bed, x-ray hits you, the heart starts pumping and they're able to see that.

Originally, when the first time I used it, they had very low quality, but by the time I went to Image Sciences, they had improved dramatically. Some of the work I did at Imaging Sciences, I found out why and I helped them even more to improve it even beyond that.

Q. Why was your experience working with the Varian detector or sensor, why was that relevant to Imaging

11:19:41 1

Sciences?

11:19:41 2

A. Because at the time they were interested in making a

11:19:44 3

product for dentistry, the cone beam CT, what we have heard

11:19:50 4

of already, the CBCT, and the most expensive component of

11:19:55 5

that product was the Varian panel. They detected the x-ray

11:19:59 6

as it's rotating around the head and using those

11:20:04 7

projections, they were able to make the 3D volume that would

11:20:07 8

show various elements of the head structures.

11:20:10 9

Q. When did you join Imaging Sciences?

11:20:14 10

A. It was in January of 2004.

11:20:16 11

Q. How long did you work there?

11:20:17 12

A. About five years.

11:20:19 13

Q. And so what did you work on while you were there?

11:20:22 14

A. So I worked on -- I worked on just about everything,

11:20:27 15

maybe I did not specify the color of the machine, but

11:20:30 16

primarily anything that did digital, I had to provide input

11:20:34 17

on. The type of x-ray. The type of motion. The software

11:20:42 18

that was written. Just about anything that would affect the

11:20:47 19

process of CBCT I was involved with.

11:20:51 20

Q. You say everything, you're referring to the

11:20:54 21

development by imaging sciences of a CBCT dental imaging, is

11:20:58 22

that what you mean?

11:20:59 23

A. That's correct, yes.

11:21:01 24

Q. As part of that work, did you get any patents?

11:21:02 25

A. I received a number of patents. I'm an inventor of

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11:21:12 1 over 18 U.S. patents. And all of the patents that I
11:21:15 2 received while at the -- that I submitted at imaging
11:21:20 3 science, they were of an imaging clerk check.

11:21:28 4 Q. I pulled up here slide four from your demonstratives.
11:21:32 5 You got an image here of a patent, and one of the figures,
11:21:36 6 is that one of the patents that you're an inventor on?

11:21:39 7 A. Absolutely, this is a patent you can see the title,
11:21:46 8 Digital Scanner, this is one of the patents, it shows our
11:21:48 9 machine, our first generation machine on the left side, a
11:21:52 10 single person position connected to a computer that would
11:21:54 11 receive the data to perform the Feldkamp reconstruction,
11:22:02 12 that's the CBCT, and that is then generated and is provided
11:22:04 13 as a result on the display to the user.

11:22:10 14 Q. So is this one of the types of systems that you
11:22:13 15 worked on at imaging science?

11:22:15 16 A. That's correct, yes, sir.

11:22:18 17 Q. Go back a second. Have you ever served as an expert
11:22:21 18 witness in a patent case?

11:22:23 19 A. Yes, sir, I have, for over 25 years.

11:22:26 20 Q. I'm sorry, over 25 years?

11:22:28 21 A. Over 25 years. No, 22 years, sorry, yes.

11:22:31 22 Q. How many cases have you worked on?

11:22:34 23 A. A number of cases, over 25 patent cases.

11:22:40 24 Q. Did any of the patent cases for which you were an
11:22:42 25 expert involve dental imaging systems?

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11:22:51 1 A. Remotely, not x-ray digital imaging systems.

11:22:57 2 Q. How about imaging systems in general?

11:22:59 3 A. Oh, yes, a number of imaging systems.

11:23:01 4 Q. Like what, to the extent you're allowed to discuss,
11:23:04 5 can you give me an example?

11:23:05 6 A. Absolutely. My favorite story is the set of patents
11:23:11 7 that got me started in this business. So when I was a chief
11:23:15 8 technical officer at a medical imaging company, about 18
11:23:19 9 patents were served on to me. And we were very, very small
11:23:23 10 company. So after settling which we didn't really settle,
11:23:27 11 our market was extremely small, the law firm pretty much
11:23:31 12 said the conversation I have with you I lost money, so
11:23:35 13 you're off the hook. Once I left the company, the law firm
11:23:39 14 approached me and said since you know all about these
11:23:43 15 patents, please come and work for us. One of my favorite
11:23:47 16 was pulse x-ray. And pulse x-ray is almost like taking
11:23:51 17 flash photography, flash and take an image. And this system
11:23:55 18 had to be used in what's called a digital sub tracks and you
11:24:00 19 photograph it. You take an image of the foot and you inject
11:24:04 20 something and you take a same exact image, and it shows the
11:24:08 21 contrast in the veins. So you need post x-rays, boom, boom,
11:24:12 22 otherwise you can't do it. And my response to counsel was
11:24:16 23 oh, my God, this is like breathing, everybody has to do it.
11:24:20 24 If you're doing digital sub tracks this is the only way of
11:24:24 25 doing it, so that's what we did. We don't have to fight it,

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11:24:33 1 don't analyze it, just talk to counsel see what kind of
11:24:37 2 agreement you can come to.

11:24:39 3 Q. And do you have any proficiency with computer
11:24:42 4 programing?

11:24:42 5 A. Yes, sir. Actually the first time I ever wrote a
11:24:48 6 program it was in the 1979, and in that process I was in
11:24:53 7 high school, I had to teach my teachers how to program so
11:24:57 8 that in later years they would teach others. Mr. Robinson,
11:25:02 9 he was great.

11:25:04 10 Q. Did you do any programing since 1979?

11:25:07 11 A. Absolutely. Yes. I taught programing when I had my
11:25:14 12 masters, I actually taught CST program, when it came out, I
11:25:20 13 immediately learned programing and started using that, I
11:25:23 14 learned a large number of programing and if something new
11:25:27 15 comes up I'm very well versed in learning it right away.

11:25:30 16 MR. OSTROW: Your Honor, at this time, Osseo
11:25:34 17 offers Dr. Kia as an expert in the field of x-ray imaging,
11:25:37 18 dental imaging with particular focus on CBCT and digital
11:25:41 19 signal and image process.

11:25:43 20 THE COURT: Your response?

11:25:46 21 MR. QURESHI: Your Honor, we don't challenge his
11:25:49 22 credentials.

11:25:49 23 THE COURT: He's accepted.

11:25:50 24 BY MR. OSTROW:

11:25:52 25 Q. So Dr. Kia, what is it you're here, with a little

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11:25:54 1 more particularly, what is it you're going to discuss today?

11:25:57 2 A. I am going to discuss the patents, in particular the
11:26:05 3 patents itself, what they are, also the infringement of the
11:26:12 4 patents with respect to Planmeca's products. Validity of
11:26:18 5 those patents. And also damages -- well, the valuation of
11:26:25 6 the contribution of the patents on those products.

11:26:28 7 Q. So let's start with that first topic and I know the
11:26:31 8 jury has now heard a few times these issues so maybe we can
11:26:35 9 go through this a little bit quickly. Explain again, what
11:26:38 10 is a patent and what is it for?

11:26:41 11 A. Yeah, so a patent is a property right. That allows
11:26:44 12 the patent owner to make, use, or sell, or patent the
11:26:47 13 invention, and be able to enforce that on others to do the
11:26:50 14 same.

11:26:53 15 Q. And having gotten 18 patents yourself, as an
11:27:00 16 inventor, do you have an understanding about the process of
11:27:03 17 getting patents?

11:27:06 18 A. Yes, sir, absolutely I have a good understanding.

11:27:09 19 Q. Can you walk us through that?

11:27:12 20 A. Absolutely. The first step is to come up with an
11:27:15 21 idea that is new, if there is something that you solve a new
11:27:18 22 solution, then you write that down, how it's done, approach
11:27:21 23 a lawyer that submits a patent to a Patent Office. The
11:27:24 24 examiner is assigned and there is a back and forth to
11:27:27 25 justify that this is a unique, new concept, are the patents

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11:27:39 1 valid, and after office actions, possibly, you are granted a
11:27:44 2 patent or you're denied a patent.

11:27:49 3 Q. Do you have an understanding as to what the Patent
11:27:52 4 Office or the patent examiner looks for during the
11:27:56 5 examination?

11:27:56 6 A. Absolutely. So they do a thorough search on the
11:28:00 7 claims and search the prior art. They look for where is in
11:28:08 8 the prior art that this invention could have been practiced,
11:28:11 9 could have been implemented. And they look for novelty
11:28:15 10 within that respect.

11:28:17 11 Q. Anything else?

11:28:19 12 A. They also judge to see if the written description is
11:28:24 13 sufficient such that one of ordinary skill in the art at the
11:28:30 14 time of the invention could make the invention.

11:28:34 15 Q. And do you have an understanding why that is
11:28:39 16 important?

11:28:41 17 A. Yes, sir. So this is almost like a quality control
11:28:45 18 such as what could possibly come up in cases, even cases
11:28:51 19 like this in that the answers that are presumed would be try
11:28:56 20 to get an answer before a patent is given so that we don't
11:29:02 21 go back and can sell a patent. If there is a good idea, try
11:29:07 22 to do the best possible output as you can up front so that
11:29:13 23 it doesn't come back to you later.

11:29:17 24 Q. Okay. Again, I know the jury has heard this, let's
11:29:22 25 just see if we can get through it quickly. What are the

11:29:23 1 different parts of the patent?

11:29:24 2 A. Yes, sir. So the main two parts are the written
11:29:28 3 description which includes the figures and the written part,
11:29:31 4 and then the second part are the claims, there are a number
11:29:35 5 of paragraphs, and the claims are supposed to be interpreted
11:29:40 6 consistent with the written description. So they have to
11:29:43 7 match what has been described. The claims mark the property
11:29:47 8 boundary, it gives notice to one of ordinary skill in the
11:29:51 9 art to anybody of what is invented.

11:29:55 10 Q. You used the term now a couple of times, I want to
11:29:58 11 make sure we all understand what you mean. You said
11:30:00 12 something about a person of ordinary skill in the art.

11:30:02 13 Right. Did I hear that?

11:30:03 14 A. Yes, sir.

11:30:04 15 Q. What does that mean?

11:30:05 16 A. First of all a person of ordinary skill in the art is
11:30:08 17 a hypothetical person, it really doesn't exist, it doesn't
11:30:12 18 have a first or last name, but it is described so that
11:30:16 19 someone analyzing would put themselves in their shoes. And
11:30:21 20 this person would have average knowledge, average ability,
11:30:25 21 average sense of where the field is, and the related field.
11:30:30 22 So a hypothetical person is specified by their education, by
11:30:34 23 their experience, and that specifies what would have -- what
11:30:40 24 a person if they were to read this patent would have that
11:30:44 25 average ability.

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Q. And do you have an opinion as to what this hypothetical person of ordinary skill in the art would have, what level of skill they would have for the patents involved in this case?

A. Absolutely. Yes, sir. So my definition of one of ordinary skill in the art would be a person that has a bachelor's degree in electrical or computer engineering, plus 3 to 5 years of taking that ability and working in a diagnostic imaging environment that uses the techniques that are described in the patent.

Q. And do you think you qualified as a person of ordinary skill in the art back when Dr. Massie filed his patents in 1999?

A. So, the requirements of one of ordinary skill in the art is a minimum, so I exceed that minimum which means that I do meet it, but I also have a lot more experience than that minimum. So I do meet the requirements of one of ordinary skill in the art, but I also exceed it.

Q. You mentioned earlier that one of the topics upon which you're going to give an opinion today is whether Planmeca's system that's been accused of infringement is in fact infringing. Can you explain to us your understanding of what it takes to show infringement?

A. Yes, sir. So when looking at claims, and let's say we are looking at an independent claim as is shown, each

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claim has elements. It has a requirement to do certain things. Each one of those elements has to be satisfied, not just some of them, all of them need to be satisfied for a product to infringe, so this is for an independent claim. For a dependent claim, the dependent claim depends on another claim. So it adds another limitation. So if the independent claim or another dependent claim, if all elements are met, the new dependent claim, the new element also has to be met. So the product that infringes the claim that it's dependent on has to also have this new added element that it has to meet in order for the claim to be infringed.

Q. All right. Let's turn now to Dr. Massie's patents, the Osseo patents in this case. Now, I have given you in your witness binder copies of the patents. They've already been admitted into evidence as JX-1, 2 and 3. These are behind tabs B, C and D in your witness binder in case you need to refer to them.

A. Thank you.

Q. Have you reviewed the patents?

A. Yes, sir, I have.

Q. Can you give us your understanding of the -- a summary of what the patents are about?

A. Yes, sir. They're generally about 3D dental imaging systems. And in particular, it's dental imaging that

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performs 3D cone beam computer tomography. So that's evaluating the dental anatomy of the patient. And also it creates a tomography densitometry model which will present the teeth and the bone density.

Q. Can you explain to us what -- I know we have heard a bit about this before, what is cone beam computed tomography?

A. Absolutely. Cone beam computed tomography is a version of computer tomography, and computer tomography in basic terms is you have an x-ray source and you have a detector. And you rotate it around a subject. So you get a look at that subject from all angles. So with an x-ray, when you have one projection, what happens is that that x-ray super imposes multiple shadows. The x-ray goes through everything. See if I have my hand, just one hand, it shows a shadow of one hand, if I have two hands, it would show both shadows so they overlay on top of each other, on one image. In order to separate the hands, I need to be able to look at it at different angles so I can separate them. So computer tomography kind of does that. The process once you have these over laid shadows, the process is called back projection. If you have a pixel where did it go in space, where did it come from, because the x-ray is kind of small, almost a point target, okay, so this ray that it went through, where did it go to? From all different

angles, hundreds of angles, you take a look and you separate them. The cone beam feature is that the x-ray detector is actually rectangular, so if you have a point source emanating and filling up that rectangle, that becomes a cone. So at the top edges, the rays are at an angle, in a middle, it's direct, again, so you have this and the back projection does the mathematics that brings it back to the x-ray and builds that volume, that what was that volume that the ray traveled to, that's in short computer tomography.

Q. I know we're going to talk about this a little bit later in the context of the claims, but just can you give a high level, give us a high level understanding of what a densitometry model is in this context?

A. Absolutely. So once you have this three dimensional data set, you can view it from all sorts of angles. You can make slices at any angle, at any level, you can make the slices thicker, thinner, you can apply a number of algorithms to it. One such algorithm is if you make a thick slice you can take an average of those slices and show it as an image, or you can take a maximum or you can take a minimum, so there is a lot of different ways that you can divide data out of this volume. So from there, having the access to display any type of angles, you have the ability to cut through the anatomy that you're interested and that gives the ability to have a model, to have an access of the

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model of the patient's teeth structure. The density is that once you're making those cuts, once you're making the area that you're interested in, the bone and the teeth that intersected that is that density. It follows the density of the bone, if you have soft bone, it can show it, if you have hard bone, it will show it. One of the things that is prevailing in bones and we have all seen it before, you have a bone, you have a matter, pattern, the pattern, the soft part in the middle is quite visible in these types of scans.

Q. Can you tell us prior to the filing of Dr. Massie's patents what kind of imaging systems were available for dentists?

A. Absolutely. So my favorite is the bite winning, this is where you go to the doctor, to the dentist, he puts something in your mouth, there is a film or sensor and an x-ray takes the image. So this is an example of something like that. If you pay close attention, you cannot see that very well in this image, but you see the top teeth and the bottom teeth, and on my slide I can see it, I can see it on the display shown on the wall, there is a layer right between the teeth and it shows the plastic, the one that you're actually biting on. This is a common technique, it is called a radiograph, and one of the things I would like to bring your attention to, is that you have a really good view of the teeth, at the inside of the teeth, at the

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11:39:14 1 canals, but pay attention to where the tubercular bone, the
11:39:21 2 bone that's in the teeth, it's got the little squiggly, wavy
11:39:24 3 thing, if you follow those squiggly things, you see that
11:39:27 4 some of that pattern goes on top of the teeth. See where
11:39:30 5 the roots are? It happens all at the bottom.

11:39:33 6 Q. Dr. Kia, I'm sorry to interrupt you, I have a feeling
11:39:37 7 that we're all having trouble understanding what you're
11:39:40 8 referring to.

11:39:41 9 MR. OSTROW: Your Honor, may I approach and give
11:39:42 10 the witness a laser pen?

11:39:51 11 THE COURT: Absolutely.

11:39:55 12 A. So right there in the middle, that's the plastic part
11:40:00 13 I was talking about. You cannot see it very well, but I can
11:40:03 14 see it on my display. So these are the teeth, these are the
11:40:07 15 roots. And in between right there, right there, these are
11:40:11 16 the bone. Okay?

11:40:13 17 So this pattern that you have here is a
11:40:17 18 tubercular pattern of the bone. The thing I want to
11:40:21 19 emphasize is that this pattern, you can kind of see it right
11:40:25 20 here, the same pattern, you can kind of see it right there
11:40:28 21 and there. So what's happening here is exactly what I was
11:40:32 22 telling you with the hand example, so you have the bone, the
11:40:37 23 roots, and the bone again. All of this are smushed
11:40:41 24 together, the shadow on top of shadow on top of shadow.
11:40:42 25 Okay?

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11:40:47 1 And one of the reasons that this is a very good
11:40:50 2 image for dentists of why they put the film inside your
11:40:54 3 mouth, why don't they put it outside. You can imagine, in
11:40:57 4 that overlap if they put it outside, you're going to get
11:41:01 5 these teeth and these teeth together, you don't want that,
11:41:05 6 you want it inside so you just minimize as much as of the
11:41:09 7 overlap as you can, so you do see the structures you would
11:41:13 8 like to see.

11:41:14 9 Q. Any other kinds of dental images, imaging that was
11:41:17 10 available prior to the invention?

11:41:19 11 A. Yes, sir. The common one was panoramic imaging, I
11:41:23 12 actually worked on this extensively. Prior to me joining
11:41:30 13 Imaging Sciences, they actually had a machine that's shown
11:41:33 14 there, the panoramic CMT which generated an image like this.
11:41:38 15 See this image is not from a panorex, but it made an image
11:41:43 16 just like it. Just for demonstration purpose so I can
11:41:47 17 explain some of the facets of this imaging.

11:41:50 18 So I think, as was explained earlier, this is
11:41:54 19 when a patient goes to a machine, usually there is a bite,
11:41:58 20 so you bite on something plastic and it's angulated such
11:42:02 21 that precisely our front teeth goes on what is called a
11:42:06 22 focal spot so that the teeth that are in the middle would be
11:42:09 23 in the best focus possible. Then the machine rotates around
11:42:14 24 your head and gets, it's a curved focal plane that then gets
11:42:22 25 displayed in a flat image.

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11:42:25 1 Now a couple of things about this. You notice
11:42:28 2 this area over here, and that area over there, this is
11:42:32 3 actually your spine. Okay. And the way it works out is
11:42:36 4 that when it starts, the detectors in the back so it kind of
11:42:41 5 gets your spine.

11:42:42 6 As it rotates, okay, it does the curvature to
11:42:47 7 focus in on your dentures, your dental anatomy. Okay? So
11:42:54 8 one of the things with that is just about every one of these
11:42:58 9 machines, you want the detector as close to you're anatomy
11:43:03 10 as possible, that way you improve efficiency, x-ray is okay
11:43:07 11 to have far, but using the other way, it's easy to lose
11:43:11 12 efficiency, as it's traveling away, it's not a good sign.

11:43:15 13 What happens as it's rotating is it's focusing
11:43:19 14 on, but what about the other areas. So for example, right
11:43:24 15 here, at the back end of your mandible, the x-ray is on one
11:43:31 16 side the x-ray is on the other side, it goes through the
11:43:35 17 mandible, where is the other mandible, it is only one
11:43:39 18 mandible, where is the other mandible in the back, it was in
11:43:42 19 the image. That's where the focusing is coming in.

11:43:45 20 As it's moving, there is an aperture that gets
11:43:49 21 illuminated and the film just moves in the right amount to
11:43:53 22 blur out this other and focuses this one. And what happens
11:43:57 23 is the areas that I have got circled for you, so this kind
11:44:01 24 of triangle, this is bite triangle, which you can kind of
11:44:05 25 see there, too, this is kind of like a shadow, it's part of

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the blurring process. Something on the other side blurred it out. But the anatomy that followed the film, the anatomy that followed the film, these guys, the roots, the teeth, they came out, it was in focus. Okay?

Another thing is right there, you see those streaks going to the side, that's also the blurred image. Something that was not in the focal layer blurred out. Okay? There is a couple of other things, and as you notice, as you come here, this area is the special area, you see how this part is a little lighter than that part. What happens here is that our heads are thinner this way and here. So by the time the x-ray goes and hits us from front it has to go through more anatomy.

So there is tricks you play. You can increase the x-ray, you can slow down the movement so the detector would get more x-rays, and that's the kind of artifacts you get. You get a little dimple here, okay. The slow down and speed up did not match quite well, so it sped up a little too fast on this side, it's a little whiter. All of that.

Now, the result is that during this focal trowel, these teeth over here are shown bigger than what they really are. See across the image, the sizes don't remain the same. Okay? The pixel values are adjusted by anatomy that's behind us and blurred out. So there is a lot of variety in this image that would, even from the same

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11:46:02 1 patient to the same patient, you might not get the same
11:46:05 2 image.

11:46:06 3 Q. Is there a problem for dentists caused by the
11:46:10 4 blurring and artifacts that you just described?

11:46:13 5 A. There is a number of problems. Especially for this
11:46:18 6 machine, the cassette, the film that exposes it is right
11:46:23 7 there. And you use this to do yet more advanced. Imaging
11:46:30 8 Sciences at the time sold this machine as an advanced dental
11:46:33 9 imaging. And that is let's say you're missing a tooth
11:46:38 10 there, and you want to put an implant. Well because of this
11:46:41 11 distortion, you don't know exactly where that is. Okay?
11:46:45 12 And what Imaging Sciences did through their documentation, I
11:46:50 13 was part of it, instead of taking this image and say I want
11:46:53 14 an implant there, and they say no, no, give me the tooth
11:47:00 15 number that's more accurate than me specifying this on this
11:47:03 16 image. Imagine that, every tooth has a number so you dial
11:47:07 17 it into the machine to go to the location to give you this
11:47:12 18 other view.

11:47:15 19 Q. Let's move on to another type of imaging technology
11:47:20 20 in the dental field which is tomosynthesis. What is
11:47:30 21 tomosynthesis?

11:47:32 22 A. Tomosynthesis by itself is the same type of focusing
11:47:40 23 but on a localized area. You have anatomy before and after,
11:47:50 24 and use motion to blur out areas that you're not interested
11:47:53 25 in, and you focus on the areas that you're interested in. I

Kia - direct

11:48:00 1 can explain it with this slide. Using that same machine,
11:48:05 2 that's the x-ray and that's the film. We first make an
11:48:13 3 image of the site, the first part is the mandible that we
11:48:18 4 just saw before, and here you see there are teeth are
11:48:20 5 missing, it's very visible, the top teeth are there and
11:48:26 6 there are teeth missing, and the doctor wants to be able to
11:48:29 7 put an implant somewhere in there. That small portion of
11:48:33 8 the image is almost like a partial panoramic image.

11:48:36 9 So then what happens is that after having that
11:48:39 10 site, the machine takes the cross slices of it. So these
11:48:41 11 images are somewhere in here. The exact location is kind of
11:48:44 12 unknown, the doctor has to kind of find it by itself because
11:48:51 13 of the inaccuracies as I mentioned.

11:48:54 14 But the way it works out is that, so, if you
11:48:58 15 have, let's see, if I have an x-ray and the detector like
11:49:01 16 this, and then you want to put an implant on the left part
11:49:04 17 of your mandible, the machine moves like this, so it's going
11:49:11 18 across into the mandible and does this motion, high
11:49:19 19 cycloidal motion, the part, a slice as the x-ray moves up
11:49:23 20 and down is always in focus. So anything that's in the
11:49:26 21 front gets blurred out, anything in the back gets blurred
11:49:29 22 out. Okay?

11:49:33 23 I have a good example. Suppose that slice was
11:49:36 24 farther up, farther down, and I have an x-ray, that means
11:49:39 25 that this would get magnified more. So this motion would be

a lot higher. If that slice was closer in to the plate, it would be less motion because your slice area as your x-ray is moving is not that much. But if it's far, it's a lot.

So the high cycloidal motion was an advanced technique by Imaging Science. It kind of got rid of some of the other artifacts that linear, linear motion would give. And other very widely used was this concentric circle, okay? So some of our competitors were using either linear, vertical or some variation, concentric circles, so we had the high cycloidal motion like a circle this way and then this way, like a clover leaf.

Q. Just, I want to make sure we all understand what you're referring to. You referred now to the mandible a couple of times. What is the mandible?

A. I'm sorry. The mandible is the bone structure that's at the bottom. And the mandible has various anatomies that are very, very important to the nerve canal there. If you perform surgeries there is a lot of different things that you need to keep aware of. It's also one of the strongest bones in your body.

The other example at the bottom is a maxilla, which is the other part, the top part. And the example there, so that's the maxilla, this is the bottom teeth, and these are the initial site locations to put the implant where there is bone.

Kia - direct

11:51:29 1 Q. Dr. Kia, so, these existing dental imaging
11:51:35 2 techniques, were they adequate for dentists to determine
11:51:38 3 where and how to put implants?

11:51:40 4 A. No, they were not.

11:51:41 5 Q. Why not?

11:51:42 6 A. These were the best at the time. But they were not
11:51:45 7 sufficient, no.

11:51:46 8 Q. Why not?

11:51:47 9 A. Because you still did not have a good idea of what
11:51:50 10 the density of the site, the location that you're going to
11:51:54 11 put an implant in. What an implant is, is pretty much a
11:51:59 12 screw, a specialized screw. The place that you want to
11:52:04 13 place the implant, the doctor first drills like a pilot hole
11:52:09 14 and this implant gets screwed in. So there is a lot of
11:52:13 15 different implant types. And some of them are tailored for
11:52:17 16 different bone types. The thread density, the extent of the
11:52:21 17 thread, the size, there is a lot of variations that provides
11:52:27 18 the practitioner to fine tune their treatment.

11:52:31 19 Q. And is it important for practitioners who are going
11:52:37 20 to be inserting implants to know bone density?

11:52:42 21 A. Absolutely, the bone density is crucial. As you
11:52:47 22 mentioned earlier, it's like a post you put in the mud, if
11:52:52 23 you put concrete on it and it will stay, but you put it in
11:52:57 24 the mud it will fall over, and I have seen plenty, plenty of
11:53:02 25 columns just like that.

Kia - direct

11:53:02 1 Q. At a high level because we're going to go through the
11:53:04 2 claims, probably after lunch, what, can you give us a sense
11:53:08 3 of how did Dr. Massie's inventions and the patents solve
11:53:12 4 some of these problems?

11:53:13 5 A. Yes, sir.

11:53:13 6 So the goal of Dr. Massie's invention was to
11:53:17 7 obtain a complete model of the patient's jaw and teeth that
11:53:22 8 includes bone density information.

11:53:25 9 Q. And how does it do that?

11:53:27 10 A. Well, it does that through the steps that he provides
11:53:31 11 in his claims, in particular he takes a tomographic scan of
11:53:35 12 the patient's teeth and bone with x-rays.

11:53:38 13 Q. What do you mean by tomographic scan?

11:53:41 14 A. So a tomographic scan is a process as I've mentioned
11:53:45 15 to you earlier with the CBCT, the x-ray, gets the patient,
11:53:50 16 takes the image, and that image is part of an overall CBCT
11:53:54 17 scan. So those hundreds of images that are taken as the
11:54:00 18 x-ray and the detector goes around the head, each one of
11:54:04 19 those images is a single contribution to the scan, as a
11:54:10 20 whole, all of those images are the tomographic scan.

11:54:14 21 Q. What else is involved?

11:54:18 22 A. Once the images are formed, they're in analog form.
11:54:22 23 It's almost like little capacitors on the detectors where
11:54:26 24 they charge up, the photons that hits it makes electron
11:54:30 25 pairs, they charge up the capacitors and voltages, those are

Kia - direct

read out, they have to be read out, converted to digital form by the use of A to D converters, it converts the scans to digital data. Once you have the digital data, the algorithm, the back projection that we discussed, that is where the merging of the scan takes place and into tomographic model that also includes bone density.

Q. I know you mentioned this before, what is a back projection?

A. Yes, sir. So okay, back projection. The best way I can describe it is, suppose you have something behind something else. You cannot see through it, but when you rotate it, you can. So this is if you have some number that describes two objects that are overlapping, as you rotate, as you have different angles, you can have a number that is separating them. So in mathematics it's kind of called the matrix inversion. You have unknowns. You have result values, you solve with the unknowns. So back projection does exactly that. So for every pixel on the detector, a single ray traces back to the x-ray. All of the volume elements that interacts with are the unknowns. The value of the x-ray that was impinged on the detector, that's the known part. So back projection is the process of solving all those unknowns. And there is a lot of unknowns, it's a horrendous problem. This did an amazing job for creating shortcuts in order to come up with the result really fast,

Kia - direct

11:56:26 1 but it is a very complicated algorithm.

11:56:30 2 Q. In your view, were the inventions claimed in
11:56:39 3 Dr. Massie's patents new?

11:56:41 4 A. Absolutely, they were fundamental. They form the
11:56:47 5 basis of how the dentist delivers treatment today in
11:56:54 6 implantology and also oral surgery related fields.

11:57:04 7 Q. You're also here to discuss, I think you mentioned
11:57:07 8 the infringement by Planmeca?

11:57:10 9 A. Yes, sir.

11:57:11 10 MR. OSTROW: Your Honor, I'm just offering up,
11:57:13 11 we're obviously going to switch to another topic, it's
11:57:17 12 11:57.

11:57:17 13 THE COURT: Is this a good time to break?

11:57:20 14 MR. OSTROW: That's what I was saying.

11:57:21 15 THE COURT: I thought that's what you were
11:57:23 16 saying. I think that's what everybody hoped you were
11:57:26 17 saying. Ladies and gentlemen, at this time we'll take
11:57:29 18 lunch. We have lunch brought in, correct. It's here and
11:57:31 19 everything.

11:57:32 20 COURT CLERK: Yes.

11:57:33 21 THE COURT: Okay. Let's take an hour today just
11:57:40 22 to be sure. Okay? I think we're ahead of schedule enough
11:57:43 23 that we can take an hour. All right. So let's do that,
11:57:50 24 ladies and gentlemen.

11:57:52 25 COURT CLERK: All rise.

Kia - direct

11:58:13 1 (Jury leaving the courtroom at 11:58 a.m.)

11:58:24 2 (A luncheon recess was taken.)

13:02:24 3 COURT CLERK: All rise.

13:02:27 4 THE COURT: Bring the jury out.

13:02:30 5 (Jury entering the courtroom at 1:02 p.m.)

13:02:48 6 THE COURT: Please be seated, ladies and

13:02:52 7 gentlemen. And Dr. Kia, if you would come back to the

13:02:56 8 witness stand. I'll remind you, you're still under oath,

13:03:05 9 sir.

13:03:06 10 THE WITNESS: Yes, sir.

13:03:08 11 BY MR. OSTROW:

13:03:14 12 Q. Hello again, Dr. Kia. One thing I meant to ask you
13:03:17 13 earlier, the title doctor, are you a medical doctor?

13:03:21 14 A. No, sir, I'm not a medical doctor, I have a Ph.D.
13:03:24 15 degree, but it's still a doctor of philosophy.

13:03:28 16 Q. Just wanted to clarify. Thank you.

13:03:31 17 Before we move on to sort of the next section, I
13:03:34 18 think I had neglected to let you finish your description of
13:03:37 19 Dr. Massie's invention, so I went back to this slide here
13:03:40 20 that we were looking at. I think you discussed the version
13:03:43 21 of the tomographic scans and the tomographic model, if I
13:03:46 22 remember correctly, what else is involved?

13:03:50 23 A. Yes, sir. So in the third element after they take
13:03:53 24 tomographic scans of patient's teeth and bone with x-rays,
13:04:00 25 which is highlighted in red, and it's denoted in red boxes,

Kia - direct

in the block diagram. So the tomographic scans are enabled by the three axis positioning motor, the x-ray equipment, the source, the detector array, the implant prosthesis, and the dental orthopedic structure in the middle. After convert scans to digital data which is the purple color, the A/D converter, Box 20. And then the merging scan into a tomographic model that includes bone density, in that Box 22, the merger. And then after that, the last step is to store the patient's model for display and comparison other model highlighted in green, the controller having memory device, micro processor, the tomographic model, densitometry modeling and output device.

Q. Let's move on to -- all right. Let's start with, before we get into the Planmeca system, we want to understand how you came to learn what you know about it. Can you tell us what materials you studied to form your opinion?

A. Absolutely. So I first studied the patents, the Massie-Osseo patents, its history, the file wrapper, the prosecution it went through, and also the Court's construction of the claim terms for each -- some of the elements in the claims have been construed to mean something specific. So I have to keep that in mind.

Then I moved on to Planmeca's documents, which was a lot of manuals from user manuals, installation

Kia - direct

13:06:05 1 manuals, marketing materials, promotion materials. And I
13:06:11 2 also scoured the website looking at the information that
13:06:14 3 they provide for their potential customers and their current
13:06:18 4 customers and any other information that they provide on
13:06:21 5 their website.

13:06:22 6 And I also read the deposition transcript of
13:06:27 7 Planmeca's representative, and see what they had to say.
13:06:33 8 And I also looked at Osseo's infringement contentions, the
13:06:40 9 claim charts that map the claims to the information
13:06:43 10 available and what is matching the claim.

13:06:46 11 Q. How many of these manuals do you think you reviewed?

13:06:51 12 A. I reviewed a lot of manuals, from broad range, my
13:06:54 13 guess is over 25 manuals.

13:06:59 14 Q. And what about software, the software itself, did you
13:07:04 15 do anything with respect to the ROM software?

13:07:09 16 A. Yes, I also reviewed ROM software, the gentleman that
13:07:14 17 performed the software, and he provided me the printout of
13:07:17 18 the software of the system, and I also spoke with him,
13:07:21 19 discussed what is it that you produce, how is it that the --
13:07:24 20 we went and reviewed it and had a dialogue with him of what
13:07:31 21 the software does.

13:07:34 22 Q. All right. And having reviewed all these materials,
13:07:40 23 did these form the basis of the opinions you're going to
13:07:43 24 provide?

13:07:46 25 A. Yes, sir, these helped me form my opinions.

Kia - direct

13:07:47 1 Q. I gave you, you should still have the witness
13:07:51 2 binders.

13:07:51 3 A. Yes, sir.

13:07:52 4 Q. I'm going to ask you to turn to tab F of binder one?

13:07:58 5 A. Yes, sir.

13:07:59 6 Q. Can you take a look at this, it's the document that's
13:08:03 7 here, and confirm that you have seen this before?

13:08:05 8 A. Yes, sir, I have seen this before. This is the
13:08:08 9 Planmeca ProMax 3D Plus and 3D Mid user's manual for 3D
13:08:15 10 imaging. It provides various information of how to use the
13:08:21 11 product. And I note that it was released on September 13th,
13:08:30 12 2017.

13:08:30 13 Q. Is this one of the manuals you reviewed in performing
13:08:34 14 your opinion?

13:08:35 15 A. Yes, sir.

13:08:35 16 MR. OSTROW: Your Honor, we move to admit PX-299
13:08:38 17 into evidence and publish it to the jury.

13:08:41 18 THE COURT: Any objection?

13:08:43 19 MR. QURESHI: No objection.

13:08:44 20 THE COURT: 299 is received.

13:08:47 21 (JTX PTX Exhibit No. 333 was admitted into
13:08:50 22 evidence.)

13:08:50 23 BY MR. OSTROW:

13:08:51 24 Q. Let's take a look at another manual. It's in tab G
13:08:52 25 of your binder. The next one over. The document here

Kia - direct

13:09:02 1 that's labeled Planmeca ProMax proceed touch installation
13:09:07 2 manual, do you see it?

13:09:08 3 A. Yes, sir, I do see it.

13:09:09 4 Q. Take a quick look at it and can you confirm whether
13:09:14 5 this is a manual you reviewed and relied on in forming your
13:09:19 6 opinion?

13:09:20 7 A. Yes, sir. So this is the ProMax, the proceed touch
13:09:26 8 manual. It has information about the x-ray unit and the
13:09:33 9 enclosures that operate the machine. And the date on the
13:09:38 10 manual for this one is that it was released on January 26,
13:09:45 11 2017.

13:09:51 12 Q. I'm sorry, I'm not sure I heard the date your voice
13:09:57 13 may have trailed off. What's the date again?

13:09:59 14 A. Sorry. The date it was released on January 26, 2017.

13:10:00 15 Q. And with respect to both -- all right. Hang on.

13:10:10 16 MR. OSTROW: Your Honor, I would like to move
13:10:17 17 PX-134 into evidence and publish it to the jury.

13:10:18 18 THE COURT: Any objection?

13:10:19 19 MR. QURESHI: No objection.

13:10:20 20 THE COURT: PX-134 is received.

13:10:21 21 (JTX PTX Exhibit No. 333 was admitted into
13:10:22 22 evidence.)

13:10:23 23 BY MR. OSTROW:

13:10:24 24 Q. With respect to both this manual, PX-134 and the one
13:10:25 25 we just looked at behind tab F which is PX-299, were there

Kia - direct

13:10:31 1 other manuals that you reviewed for the same version of the
13:10:36 2 ProMax product but perhaps from different years or different
13:10:40 3 types of manuals?

13:10:41 4 A. Yes, sir, I have reviewed manuals of different, not
13:10:47 5 quite versions because what I reviewed were primarily the
13:10:50 6 same as far as I was interested in. So yes, I did look at
13:10:54 7 other dates.

13:10:55 8 Q. And with respect to the opinions that you formed that
13:10:58 9 you're going to share with the jury, did your opinions
13:11:04 10 change based on any of the other manuals?

13:11:06 11 A. No, it did not.

13:11:08 12 Q. So the descriptions of relevant portions of the
13:11:11 13 system were the same across the manuals, is that right?

13:11:14 14 A. Yes, sir.

13:11:15 15 Q. Let me ask you to turn to tab H. Behind tab H in
13:11:21 16 your binder there is a fairly large manual called Planmeca
13:11:27 17 ROM, it's PX-89?

13:11:31 18 A. Yes, I have that.

13:11:35 19 Q. Take a quick look at this and confirm whether you
13:11:37 20 have reviewed this manual?

13:11:42 21 A. Yes, I have reviewed this manual and this is the
13:11:45 22 Romexis software which the user interacts with the
13:11:51 23 workstation. And this manual date is June 15th, 2011.

13:11:54 24 Q. And is this a manual that you reviewed and relied on
13:12:01 25 in forming your opinion?

Kia - direct

13:12:02 1 A. Yes, sir.

13:12:03 2 MR. OSTROW: Your Honor, I move to admit PX-89
13:12:07 3 into evidence and publish it to the jury.

13:12:09 4 THE COURT: Any objection.

13:12:11 5 MR. QURESHI: No objection.

13:12:11 6 THE COURT: PX-89 is received.

13:12:14 7 (JTX PTX Exhibit No. 333 was admitted into
13:12:14 8 evidence.)

13:12:14 9 BY MR. OSTROW:

13:12:18 10 Q. I'm going to ask you to take your other book, the
13:12:25 11 second binder. Just turn right to tab I.

13:12:32 12 A. Yes, sir, I'm there.

13:12:33 13 Q. Tab I has a document entitled Planmeca Romexis 5.0
13:12:40 14 user manual, do you see it?

13:12:42 15 A. Yes.

13:12:43 16 Q. I ask you take a quick look and confirm this is
13:12:46 17 another manual you reviewed in forming your opinion?

13:12:51 18 A. Yes, sir, this is another manual I reviewed similar
13:12:55 19 to the previous Romexis manual release February 7, 2018.

13:13:04 20 Q. Did you rely on the information from this manual in
13:13:07 21 forming your opinion?

13:13:07 22 A. Yes, sir, I did.

13:13:08 23 MR. OSTROW: Your Honor, I move to admit PX-90
13:13:12 24 into evidence and publish it to the jury.

13:13:14 25 THE COURT: Any objection?

Kia - direct

13:13:15 1

MR. QURESHI: No objection.

13:13:16 2

THE COURT: PX-90 is received.

13:13:18 3

(JTX PTX Exhibit No. 333 was admitted into

13:13:19 4

evidence.)

13:13:19 5

BY MR. OSTROW:

13:13:19 6

Q. Let's keep going. Dr. Kia, let's look at tab J.

13:13:25 7

A. Yes, sir, I'm there. Tab J has another Planmeca

13:13:39 8

Romexis user manual, do you see it.

13:13:41 9

A. Yes, I do.

13:13:42 10

Q. Is this another manual you relied on in forming your

13:13:45 11

opinion?

13:13:46 12

A. Yes, I reviewed this manual as well, it's another

13:13:49 13

Romexis, it was released on June 15, 2011.

13:13:53 14

THE COURT: Excuse me, 2000 what.

13:13:56 15

THE WITNESS: 2011.

13:13:57 16

THE COURT: Thank you.

13:13:58 17

13:13:58 18

MR. OSTROW: Your Honor, you move to admit PX-99

13:14:01 19

into evidence and publish it to the jury.

13:14:04 20

THE COURT: Any objection.

13:14:05 21

MR. QURESHI: No.

13:14:06 22

THE COURT: PX-99 is received.

13:14:08 23

(JTX PTX Exhibit No. 333 was admitted into

13:14:09 24

evidence.)

13:14:09 25

BY MR. OSTROW:

Kia - direct

13:14:09 1 Q. We're almost done, Dr. Kia, now we can start to talk
13:14:13 2 about the Planmeca systems. The next tab I want you to look
13:14:16 3 at is take P, P as in Peter?

13:14:19 4 A. Yes, sir.

13:14:20 5 Q. Behind tab P there is a document labeled Planmeca
13:14:27 6 ProMax 3D maximum D.D.S. sensor user manual, do you see
13:14:32 7 that?

13:14:32 8 A. Yes, sir, I see that.

13:14:33 9 Q. Did you review this manual?

13:14:35 10 A. Yes, sir, I did review this manual, and it is the
13:14:39 11 ProMax 3D/S, the design maximum and it was released on
13:14:51 12 April 6, 2011.

13:14:54 13 Q. Is this one of the manuals you relied on in forming
13:14:57 14 your opinion?

13:14:57 15 A. Yes, sir, it is.

13:14:58 16 MR. OSTROW: Your Honor, I move to admit PX-281
13:15:02 17 into evidence and publish it to the jury.

13:15:04 18 THE COURT: Any objection.

13:15:04 19 MR. QURESHI: No objection.

13:15:05 20 THE COURT: '281 is received.

13:15:08 21 (JTX PTX Exhibit No. 333 was admitted into
13:15:08 22 evidence.)

13:15:08 23 BY MR. OSTROW:

13:15:09 24 Q. Let's go the tab T.

13:15:10 25 A. Yes, sir, I'm there.

Kia - direct

13:15:12 1 Q. Behind tab T, can you review what's there and
13:15:16 2 describe for me what it is?

13:15:19 3 A. Yes, sir, tab T is electrical diagrams for various
13:15:24 4 boards with a ProMax wiring diagram. Some components of the
13:15:47 5 ProMax.

13:15:47 6 Q. Did you review materials in tab T which is PX-173 in
13:15:52 7 forming your opinion?

13:15:52 8 A. Yes, sir, I did.

13:15:54 9 Q. And you relied upon this information?

13:15:55 10 A. Yes, sir, I did.

13:15:57 11 MR. OSTROW: Your Honor, we move to admit PX-173
13:15:59 12 into evidence and publish it to the jury.

13:16:01 13 THE COURT: Any objection?

13:16:03 14 MR. QURESHI: No objection.

13:16:05 15 THE COURT: 173 is received.

13:16:07 16 (JTX PTX Exhibit No. 333 was admitted into
13:16:11 17 evidence.)

13:16:13 18 BY MR. OSTROW:

13:16:18 19 Q. With that out of the way, let's talk about the
13:16:21 20 Planmeca system?

13:16:22 21 A. Yes, sir.

13:16:24 22 Q. What is the system that you were asked to give an
13:16:30 23 opinion on with respect to infringement?

13:16:32 24 A. The ProMax 3D systems, there are several versions. I
13:16:35 25 merely the volume of the scan but they're all 3D systems.

Kia - direct

13:16:53 1 Q. So you are shown here a page from one of the manuals
13:16:59 2 that we just entered into evidence. Do you see it?

13:17:01 3 A. Yes, I do see it.

13:17:04 4 Q. Do you see this came from the PX-299 on page 14. Do
13:17:10 5 you see that?

13:17:10 6 A. Yes, sir, I do see that.

13:17:13 7 Q. So can you describe what we're looking at here?

13:17:17 8 A. Yes, sir. So this is the ProMax system. On the left
13:17:23 9 is the x-ray unit. So it holds the x-ray sensor, patient
13:17:30 10 positioning, and the rest of the system allows it to
13:17:37 11 function. Right next to it, is number two, the
13:17:43 12 reconstruction PC, so the data is received by the
13:17:49 13 reconstruction PC from the x-ray unit. And it's processed
13:17:55 14 and the result is close to what is enumerated as 3 and 4,
13:17:59 15 that's the workstation that the user interacts with to start
13:18:01 16 the scan and receive the results.

13:18:05 17 Q. Okay. Do you know what software is running on the
13:18:08 18 reconstruction server?

13:18:10 19 A. It is a back projection dual scan from the
13:18:16 20 documentation I have seen. It is controlled by, the whole
13:18:22 21 system is controlled together, so once a scan is initiated,
13:18:27 22 it receives the data and starts that reconstruction process.

13:18:32 23 Q. Now, is there only one model of the ProMax scan unit?

13:18:39 24 A. No, there is five models.

13:18:42 25 Q. What are those five models?

Kia - direct

13:18:43 1 A. So the five models are shown, they're 3D, 3D/S, S
13:18:49 2 classic, plus, mid, and max. And all of them have the 3D
13:18:55 3 nomenclature in that they perform 3D scanning, they're all
13:19:02 4 ProMaxs

13:19:03 5 Q. And do you have an understanding about why there are
13:19:05 6 five different models or what's the difference between
13:19:08 7 models?

13:19:09 8 A. Yes, sir. Based on the detector size you can have a
13:19:13 9 small scan volume as is denoted by the ProMax 3D/S, you can
13:19:19 10 incrementally increase that volume size to make it bigger
13:19:23 11 and bigger and the nomenclature, the largest one, ProMax 3D
13:19:30 12 Max gives us the largest volume as denoted in the slide.

13:19:31 13 Q. What you just described in terms of the size of the
13:19:39 14 images, is that the primary differences between these five
13:19:43 15 models?

13:19:43 16 A. That's the primary difference, yes.

13:19:45 17 Q. Are there any differences between the way these five
13:19:47 18 models work that was relevant to your opinion?

13:19:51 19 A. No, not at all.

13:19:52 20 Q. So, then, do all five models work the same way in all
13:19:57 21 relevant respects with respect to your infringement
13:20:00 22 analysis?

13:20:00 23 A. Yes, they do.

13:20:02 24 Q. Can you walk us through how the Planmeca ProMax 3D
13:20:05 25 systems work?

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13:20:09 1 A. Absolutely. So the first step is to position the
13:20:14 2 patient. So to start that up, first we need to know the
13:20:18 3 patient, the user gets on the Romexis software, either
13:20:23 4 enters new patient or retrieves an existing patient. That
13:20:27 5 will indicate that there is a scan to be made. The patient
13:20:32 6 is then brought to the x-ray unit as denoted by the left
13:20:37 7 image. The PRO Touch sensor, you can see it, it's right
13:20:43 8 below the hands of the patient. The position interacts with
13:20:48 9 that, selects the type of scan, positions it, positions the
13:20:51 10 patient because even for the smaller volume size it is
13:20:54 11 pertinent to place the patient in a place where the scan is
13:21:01 12 to be had. So the patient positioning is very important.

13:21:05 13 Once the patient positioning is complete, the
13:21:09 14 operator will then select the type of scan that he wants.
13:21:15 15 And usually with an x-ray, the technician has to leave the
13:21:20 16 room. So there is a remote button to start the scan. The
13:21:24 17 gantry moves, does the x-ray of the patient, has a detector
13:21:30 18 detect it, and then which is kind of like denoted by the
13:21:34 19 middle graphic.

13:21:38 20 The gantry turns, and the scan is taken and once
13:21:42 21 the scan is taken, that data is then provided to the
13:21:46 22 reconstruction PC, performs the Feldkamp algorithm and that
13:21:50 23 result is fed into the Romexis software where you will be
13:21:54 24 able to see the tomographic model which is kind of denoted
13:22:00 25 by that bar at the bottom of the right slide, so that type

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13:22:08 1 of result you can have at the Romexis software.

13:22:14 2 Q. Let's just step through that, that was very helpful.

13:22:17 3 Let's step through that just a little bit more in detail.

13:22:21 4 Let's again start with the ProMax 3D model imaging device,
13:22:27 5 the scanner?

13:22:35 6 A. After you have the patient positioned, the real
13:22:43 7 scanning process successfully has begun. What happens first
13:22:43 8 is that the scan creates grayscale 2D images. What that
13:22:47 9 means is that the x-ray travels in a cone, it interacts with
13:22:52 10 the anatomy. At the detector, there are pixels that gets
13:22:57 11 charged based on the amount of radiation that it intercepts.
13:23:02 12 Those are pixels, and I believe I have a slide for that,
13:23:05 13 that denotes the pixels. So the pixels are just rectangular
13:23:10 14 elements, small rectangular elements and another rectangular
13:23:14 15 element. Usually you want the pixels to be square. But
13:23:18 16 that's an easy requirement to have so you can have easy
13:23:22 17 imaging.

13:23:22 18 In each of those pixels, charges are stored
13:23:26 19 based on the light incident on them. So at that point, the
13:23:31 20 representation of the charges is the pixel, it's the image
13:23:36 21 that's captured. And each element is called a pixel. Now
13:23:39 22 the reason it's called a pixel is that in the old ages they
13:23:43 23 used to call it picture elements and it's kind of like a
13:23:47 24 long word, so after a lot of time, we just call them pixels.
13:23:52 25 We're going to get later in the voxels, but similar thing.

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13:23:57 1 So once the electrons are captured, it has to be
13:24:03 2 converted into numbers. So conversion of analog to digital
13:24:08 3 data commences. For example, the very end panel that I
13:24:14 4 talked about earlier, there is a read out from the panel,
13:24:18 5 reads out the electrons, measures the voltages basically and
13:24:23 6 those voltages, they get transferred to a data value, a
13:24:27 7 number. So low voltages will have small values, high
13:24:31 8 voltages will have higher values and those are calibrated
13:24:36 9 across pixels so they're repeated pixel by pixel, they're
13:24:41 10 consistent.

13:24:42 11 So then once that data is available, just one
13:24:46 12 image is called a projection. You take hundreds of
13:24:50 13 projections, as you go across, you can circle around the
13:24:54 14 patient, you get hundreds of projections, the more
13:24:58 15 projections you have, the more resolved data you can get.

13:25:01 16 So that data is then fed into the reconstruction
13:25:04 17 PC. What the reconstruction PC does is Feldkamp algorithm,
13:25:11 18 3D construction of 2D data create something else, that with
13:25:14 19 each he will have a calculated value, Hounsfield Unit. So I
13:25:20 20 put the general algorithm, the equation on top of the very
13:25:22 21 complicated algorithm and that's just a theoretical
13:25:30 22 representation, how you implement it, digitize it is
13:25:33 23 completely different.

13:25:36 24 Now that algorithm requires the calibration
13:25:42 25 step. Okay. So there is two calibrations involved here,

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13:25:46 1 one is geometric calibration and the other is a -- geometric
13:25:51 2 calibration is extremely important. So imagine we had that
13:25:56 3 x-ray and then the detector and those rays, so the rays
13:26:01 4 would be different if the x-ray gets closer. If I take the
13:26:06 5 x-ray and it lands right in the middle of a detector, if I
13:26:09 6 move it to the right or left, the rays would look different,
13:26:13 7 so that information needs to be given to the Feldkamp, those
13:26:16 8 exact angulations of each Ray is very, very important. So
13:26:21 9 things like what is the source to detector distance, what is
13:26:24 10 the vertical ray, there is lots of them. You know, one
13:26:29 11 problem I used to have is whether the detector was a little
13:26:32 12 bit articulated, that would have a victim so we have to
13:26:37 13 correct for that, so geometry is very, very important. Once
13:26:41 14 that geometry is done, what that means is once you have the
13:26:44 15 good geometry is now within the body, we can breakdown the
13:26:49 16 voxels one by one a lot more cleaner than if you don't have
13:26:52 17 a great geometry. Once you breakdown the voxels to
13:26:56 18 represent what is in the scan area, those numbers are CT
13:27:00 19 numbers to. To convert that CT number into Hounsfield
13:27:04 20 Units, you apply an equation which I have up there and the
13:27:10 21 CT number which you calculate is represented by the top
13:27:14 22 left, it's the sum of the material, what we do is subtract
13:27:19 23 what that material would have been if it was divided by one,
13:27:23 24 what would be water minus what would be air. What that does
13:27:28 25 is if the CT number is representing water, is inserted in

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that the Hounsfield Unit would become 0. So that's the definition of a Hounsfield Unit of rays is water.

Okay? And air is something a lot lower. So with that equation you make it minus 1,000. So the bones would be about that, in hundreds to thousands. Okay?

So I have a demonstration of the range of the Hounsfield Units here. And when you have high density, thousand Hounsfield Units, imagine that there is a lot of particular stuff within that volume, there is a lot of stuff that can absorb the x-ray. As you move to the right, when the bone is softer, you have less particular stuff, so the Hounsfield Units drop so the density is lower. You go all the way to where water is 0, 0HU, and airway is minus 1,000. And as an example, the airway is where you would get your throat, your airway passages, okay? You really don't get water, just exactly water in the head, but you do get air.

Q. Dr. Kia, we're going to have to break some of that down a bit?

A. Sorry.

Q. No, it's very helpful. But since we're here talking about Hounsfield Units and since the jury has heard a lot about it already, can you describe what is a Hounsfield Unit?

A. So the Hounsfield Unit is a calibrated measurement that is commonly used in CBCT to denote the density of the

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material that you're using, that you have access to. So for this CBCT for dental purposes, the bone and the tooth are accurate with a level that the dentist can operate on their patients.

Q. Do you know whether Hounsfield Units represent, are represented in terms of a mass over volume ratio?

A. They are not exactly mass over volume, but they're correlated. What that means is that they follow the same scale. If you have bone material that's 7 or 8 hundred, regardless of the machine you use, regardless of the patient that you use, that same bone density would be represented as 7 or 8 hundred.

Q. With respect to bone density, which is what Dr. Massie's patents were about, you're saying there is a correlation between say whatever the number of the Hounsfield Units and the density of the bone?

A. Yes, sir. Exactly.

Q. What's the nature of that correlation?

A. Well, it's 1 to 1, it follows. So the denser the object, the higher the Hounsfield Unit, the less dense the object, the lower the Hounsfield Unit.

Q. Is that relationship true with respect to any kind of anatomy in the body?

A. No.

Q. When is it different?

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13:30:46 1 A. So when you have different x-ray energies and it
13:30:52 2 interacts with softer tissue, there are problems with CT
13:31:00 3 such as being hardening, such as artifacts that change that
13:31:03 4 value. That's not reliable. But for these machines, we
13:31:08 5 tailor it to give accurate values for the bone and the
13:31:13 6 teeth.

13:31:14 7 Q. Just again, I just want to clarify, so if someone
13:31:19 8 used -- got Hounsfield Units by doing a CT of my abdomen,
13:31:25 9 say, would these soft tissue values, would they correlate to
13:31:31 10 density in the same way?

13:31:33 11 A. It would have a harder time. So you have scatter as
13:31:36 12 well as abdomen, you have soft tissue, the energy of the
13:31:41 13 x-rays is important, so that would not be as accurate as if
13:31:44 14 you were to go measure Hounsfield Units in the abdomen.

13:31:51 15 Q. You mentioned a few things, I just want to walk
13:31:54 16 through them now. Scatter, what is that?

13:31:55 17 A. Yes, sir. So scatter is fairly complicated. In the
13:32:00 18 easiest terms, the way I can demonstrate it is so we have
13:32:05 19 light coming and we see a certain light. If I put a
13:32:10 20 reflector, it becomes slightly brighter. Okay. So the same
13:32:12 21 thing happens when a plane flies over a blue sky, you see a
13:32:24 22 halo of white around it. What happens is light hits it at
13:32:28 23 this little low frequency fuzz, okay. With x-rays, x-rays
13:32:32 24 hate to bend, hate to bounce, hate to reflect, so what
13:32:35 25 happens when an x-ray hits an object, mostly a dense object

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13:32:43 1 is pretty bad, it bounces but it changes frequency, it
13:32:47 2 changes its energy. So for lack of better explanation,
13:32:52 3 imagine you hit it with a yellow light, kind of like a red
13:32:57 4 light reflects. An energy changes. So that's scatter. So
13:33:01 5 it doesn't completely go away because x-rays contained of go
13:33:05 6 through material, but the ones that don't go to the
13:33:08 7 material, that bounces changes energy and that gives you
13:33:11 8 like a halo to your environment.

13:33:14 9 And with the abdomen imaging, there is lots of
13:33:17 10 scatter, even with your head, there is some scatter.

13:33:24 11 Q. How come there is no scatter for dental imaging?

13:33:29 12 A. There is, and it can be easily corrected.

13:33:33 13 Q. How?

13:33:38 14 A. Well the way we did it was we took a scan of the
13:33:38 15 bottle of water and we knew exactly what the bottle of water
13:33:41 16 would look like and the glow around it, we used it to scan.
13:33:48 17 And I even had one patent application that I wanted to
13:33:51 18 improve on that, and I think the company abandoned it
13:33:57 19 because no one could understand it after I left.

13:34:01 20 Q. All right. You also said something about soft
13:34:03 21 tissue. Can you explain what the relevance of the soft
13:34:06 22 tissue in this imaging issue?

13:34:09 23 A. So soft tissue, in what head and neck?

13:34:13 24 Q. You were discussing if I heard you correctly about
13:34:21 25 the -- one of the reasons why the Hounsfield Unit might not

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13:34:27 1 represent the true density value for medical imaging was
13:34:31 2 because of the presence of soft tissue. Did I get that
13:34:35 3 right?

13:34:35 4 A. Yeah. Okay. So if you measuring the Hounsfield
13:34:38 5 Units for soft tissue in large areas, the thickness matters,
13:34:43 6 how much penetration -- how much x-ray is penetrating. And
13:34:47 7 one of the common factors that happens, if you have an x-ray
13:34:51 8 band of energy, as it's going through thick volumes, it
13:34:56 9 filters out the softer, softer x-rays first before harder
13:35:02 10 x-rays. Okay. So you might have certain x-ray bands that
13:35:05 11 does not go through you. That's one of the benefits of
13:35:11 12 using a medical CT is because they have detectors that have
13:35:14 13 very high dynamic range that can pump a lot of x-rays and
13:35:20 14 some of them can control their energy. So they know what to
13:35:24 15 get ahead of time. What kind of a procedure they have and
13:35:29 16 correct for that, they know the x-ray that they can take is
13:35:33 17 for what medical problem.

13:35:37 18 Q. How come, if I understand you correctly, are they the
13:35:41 19 same soft tissues issues for dental imaging?

13:35:45 20 A. Yes, but what you can easily do is you can even beam
13:35:50 21 your forehead and neck and it will interact with hard tissue
13:35:54 22 a lot easier, so you don't get some of those problems as you
13:35:58 23 get with abdomens.

13:36:00 24 Q. And what's the result of being able to interact with
13:36:04 25 the hard tissue?

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13:36:07 1 A. You get accurate Hounsfield Units that represent
13:36:11 2 density for those scans.

13:36:12 3 Q. It represents bone, the density of the hard tissue?

13:36:17 4 A. That's correct.

13:36:17 5 Q. By hard tissue, you mean bone?

13:36:20 6 A. Bone and teeth.

13:36:21 7 Q. Bone and teeth?

13:36:21 8 A. Yes.

13:36:22 9 Q. So because -- and are those the things that the
13:36:25 10 dentist is concerned with, meaning the density of the bone
13:36:29 11 and teeth?

13:36:30 12 A. Yes, absolutely, you need to know the density of the
13:36:33 13 bone, where it's going, you really don't care about the
13:36:38 14 density of the jaw or or the teeth, the tongue or the cheek
13:36:41 15 for implants, you care about the density of the bone.

13:36:48 16 Q. Let's go back to what was happening with the ProMax
13:36:52 17 system?

13:36:52 18 A. Yes. We were at the calibration step, once we
13:36:55 19 calibrated to water and air, so we have this Hounsfield Unit
13:36:59 20 range that represents the density of the materials,
13:37:02 21 especially for bone and teeth. And that result is then
13:37:07 22 given to the vision part of the Romexis software and receive
13:37:12 23 and store the tomographical density model. This is the 3D
13:37:20 24 data that captures that. And it displays the tomographical
13:37:24 25 models with the bone density data, that's what the

13:37:30 1 Hounsfield Unit.

13:37:30 2 Q. We have been using the term tomography model. Can
13:37:34 3 you take a minute to explain what you mean by that?

13:37:38 4 A. Tomographical model is that 3D results. What we see
13:37:45 5 here is the projections, the radiographs that we get, the
13:37:49 6 hundreds of them, those will have x-rays. You pull apart
13:37:54 7 the data and the volume for the reconstruction for the back
13:37:57 8 projection and you get voxels. So voxels, just like pixels,
13:38:01 9 in the early days they were called volume elements, make it
13:38:05 10 simple, just like pixels, they're now called voxels. So
13:38:10 11 each one of those voxel cubes has a number. Okay? It is a
13:38:15 12 Hounsfield Unit number at this point. It is numerical,
13:38:20 13 mathematical process went from the projections to this voxel
13:38:24 14 value. So this voxel, this set of voxels which includes all
13:38:30 15 the information, all the bone and the teeth structure of the
13:38:34 16 the anatomy you scanned, so that would be the tomographic
13:38:40 17 model.

13:38:42 18 Q. I know we have a simple representation of voxels, if
13:38:45 19 I understand you correctly, the tomographic model produced
13:38:50 20 by the ProMax system is this 3D set of data with data points
13:38:52 21 representing the Hounsfield Units, is that what you end up
13:39:00 22 getting?

13:39:00 23 A. Yes, that's correct.

13:39:01 24 Q. And those Hounsfield Units, those were calculated
13:39:05 25 through the processes that you explained?

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13:39:07 1 A. Yes, sir.

13:39:10 2 Q. And they represented as quantities?

13:39:12 3 A. They are quantities, yes.

13:39:14 4 Q. Numbers?

13:39:16 5 A. Numbers, yes.

13:39:17 6 Q. Okay. All right. Can you -- do you recognize the

13:39:22 7 images that we got up here on slide 31?

13:39:25 8 A. Yes.

13:39:25 9 A. I do, these are from the Planmeca website.

13:39:29 10 Q. And are these images that you understand to be

13:39:32 11 generated by the ProMax 3D system with Romexis?

13:39:37 12 A. Yes, sir.

13:39:39 13 Q. Can you walk the jury through what it is we're

13:39:41 14 looking at here?

13:39:42 15 A. Absolutely. Yes, sir. So the picture we have here

13:39:48 16 is a process of identifying implant sites. So this

13:39:51 17 particular site is what's called a sagittal site, so if you

13:40:02 18 have this volume, remember the voxels, the volume is a

13:40:05 19 cylinder. If you cut the cylinder in the middle, you have a

13:40:10 20 circle. This is a slice of that circle. In this particular

13:40:12 21 one, I believe this is the mandible, when you cut it and

13:40:17 22 your a seeing the roots of the teeth and the bone of the

13:40:20 23 mandible. So this gives you an idea of wherein here it

13:40:24 24 would look like if you were to look at it from top down.

13:40:30 25 So this particular one is a side view, if you

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cut the volume vertically, so you see some of the patterns of the regular pattern and the teeth come in and leave that slice, okay. And these slices are if you were to cut along these, this direction. You can see that there is some teeth there, but there are some teeth that are missing.

Now, if you remember the earlier tomosynthesis images, where you saw slides for possible implants, it was very fuzzy, the tomosynthesis, it was similar to something like this.

Q. I jumped it on you?

A. Thank you. It was similar to this, you see the comparisons. This is very fuzzy. It is the process of focusing and blurring, and you don't see very much tubercular pattern in here. Whereas the other, whereas the other, you see all that structure inside. And you see the outside bone and this soft inside, and that outside bone now has actual numbers associated with it. Those are numbers in Hounsfield Units and it represents the density of that particular anatomy which is the bone.

Q. All right. And again, when you say the Hounsfield Unit represents density, you don't mean in terms of a mass over volume, correct?

A. Yes. It's a calibrated density that the doctors can use to judge what -- how dense of a bone they are dealing with.

Kia - direct

13:42:21 1 Q. All right. What about these images on the right?

13:42:24 2 A. Yes. So the images on the right is a step forward,
13:42:29 3 this is part of a treatment planning. So before you drill
13:42:32 4 the patient, before you do anything, you want to plan to see
13:42:37 5 well what kind of an implant do I use, where do I put it,
13:42:42 6 how big of an implant is it.

13:42:43 7 After the process of region growing, so what's
13:42:46 8 happening here is that these surfaces that you see, and you
13:42:49 9 can kind of see it underneath this here, there is a photo
13:42:51 10 image being displayed on it, but underneath you see the
13:42:51 11 skull. So that process, once you have the volume, a range
13:43:01 12 of densities, a range of values are specified and it says
13:43:01 13 okay, all these ranges is bone, make a surface out of it.

13:43:11 14 So as you can see, so these are kind of
13:43:11 15 grayscale. But this is surface. So what was now bone has
13:43:21 16 been rendered as a surface model. Okay?

13:43:21 17 So that surface model you can kind of see here,
13:43:21 18 but the added benefit is that the doctor says well, I'm
13:43:31 19 going to cut right through it. This is where I think I am
13:43:31 20 going to put my implant. I have got a structure of the soft
13:43:41 21 bone around and I've got the hard bone all outside. So then
13:43:41 22 he can decide based on the density of that material, the
13:43:51 23 Hounsfield Unit of that material, does this patient require
13:43:51 24 this type of post or that type of post. As you can see
13:44:01 25 there are two different posts. Okay?

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13:44:05 1 And one other thing that it can provide is that
13:44:08 2 it's a 3D data set, so you can look at this from any angle.
13:44:13 3 What if the doctor doesn't want to go straight down, maybe
13:44:16 4 he wants to go at an angle so that the implant catches
13:44:21 5 better bone, so it's at an angle. On top of the angle you
13:44:25 6 need to put an abutment that the tooth goes on top of. If
13:44:29 7 those angles aren't right, if you bite hard you might still
13:44:33 8 break it.

13:44:34 9 A. That's what the dentist does, analyzes anatomy and
13:44:37 10 decides what is the best thing for the patient. Can the
13:44:41 11 post take it, can the angulation take it. Will it look
13:44:45 12 good. And he can do all of that here, the treatment
13:44:47 13 planning before he even touches the patient, before he
13:44:50 14 drills it.

13:44:51 15 So with this system, you have all of this
13:44:54 16 surface model, and once you have that surface model, you can
13:45:00 17 actually make a mold that sits right on top. You can design
13:45:04 18 a mold, the printer can print it, it can put a little hole
13:45:10 19 where the drill is supposed to go. So right here, the drill
13:45:14 20 at what angle, how deep to drill. One of the biggest things
13:45:20 21 that is paining doctors, especially at the time, in the late
13:45:24 22 '90s, was that the nerve canal. If you take the implant and
13:45:28 23 hit the nerve canal, it is a very, very bad situation,
13:45:32 24 extremely bad. We're talking a lot of pain, maybe part of
13:45:36 25 your face would collapse and go dead, it's very bad.

Kia - direct

13:45:43 1 Q. Dr. Kia you're scaring us. What's the nerve canal?

13:45:49 2 A. This is part of the anatomy, so that particular nerve
13:45:52 3 canal is in the mandible and there is holes in the front and
13:45:56 4 the back that it enters and exits. And it just carries the
13:46:01 5 nerves that go to the teeth, each teeth, every time you get
13:46:05 6 drilled without numbing, it hurts, that's where the nerves
13:46:08 7 go. So you want to keep away from that, and the doctor now
13:46:11 8 can decide how deep of an implant to put. What type of --
13:46:17 9 so maybe know what type of an implant, because the threads
13:46:21 10 of the implant, how it drives, what is the best sort of
13:46:28 11 treatment that they can give to the patient knowing all of
13:46:32 12 this information which is the density of the bone that
13:46:35 13 they're analyzing.

13:46:37 14 Q. Is the nerve canal a bone?

13:46:40 15 A. No, it's not, it's soft tissue.

13:46:42 16 Q. How is it showing up on those tomographic images?

13:46:45 17 A. Because the bone has a canal that carries it, so
13:46:48 18 within this structure, there is a canal, and that canal is
13:46:54 19 calcified around it, so you're able to, if you have the
13:46:58 20 right views you can see it. Even like if I look right here,
13:47:02 21 maybe I can identify it by that black hole right there. Or
13:47:08 22 we look into the algorithms of science that detected that
13:47:13 23 automatically.

13:47:14 24 Q. If you understand correctly, the system can detect
13:47:17 25 the root canal by the absence of dense bone?

Kia - direct

13:47:21 1 A. I believe Planmeca manually places it, they could
13:47:25 2 have it automatic, but yeah, calcification around the nerve
13:47:30 3 canal helps you identify the nerve canal.

13:47:33 4 Q. Now that it's detecting soft tissue?

13:47:37 5 A. It's detecting hard tissue around the nerve canal.

13:47:41 6 Q. You said earlier these kind of systems were ignoring
13:47:44 7 the soft tissue, right?

13:47:45 8 A. That's correct.

13:47:46 9 Q. The images from the Planmeca system that we're
13:47:50 10 showing up here, are any of these possible without the use
13:47:53 11 of the tomographic models having bone density data?

13:47:54 12 A. No, it's not.

13:47:54 13 Q. Why not?

13:47:54 14 A. Well, for one, if you don't have the density, you
13:48:05 15 cannot make an image of the bone. If the bone density
13:48:12 16 varies, you can have like holes where there is supposed to
13:48:18 17 be bone. If you don't have bone density, you don't know
13:48:21 18 what type of a site that you're going to drill and place the
13:48:25 19 implant. You could easily place that implant like in mud,
13:48:30 20 it will come right out. Okay?

13:48:32 21 So the tomographic data that has a density
13:48:32 22 provides that information to the doctor so he can plan
13:48:42 23 accordingly.

13:48:42 24 Q. Thank you. I want to move on to -- I want to move on
13:48:42 25 to a page, or an excerpt of one of the manuals that you

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13:48:55 1 reviewed and we entered into evidence, PX-39. Can you
13:49:01 2 explain what we're looking at here?

13:49:03 3 A. Yes, sir. So this whole process of placing the
13:49:05 4 implant is very cumbersome. So Planmeca provides a tool
13:49:12 5 called a 3D implant verification tool. These provide
13:49:18 6 various views, data, analysis, that helps the doctor analyze
13:49:25 7 the aspect that I just described, where is the implant
13:49:28 8 going, how well is it integrated with anatomy. And some of
13:49:33 9 the things I would like to show you is that, so like in
13:49:38 10 these views, it's a hypothetical implant that's being
13:49:43 11 placed. You see the jagged lines where the threads are, it
13:49:48 12 is kind of important to see where those interact with bone.
13:49:51 13 Those are the graphs that you see here. The edges of the
13:49:56 14 implant and that's the bone that's integrating it. There
13:50:01 15 are a couple of other views here. It's hard to see, but
13:50:06 16 some of the color coding, like what is red here.

13:50:11 17 Q. Is that a little better?

13:50:11 18 A. That's better. So what is red here, or natural to
13:50:18 19 this image, that's that line right there. As you look
13:50:20 20 through the image, if you were to look through that image
13:50:22 21 down the middle, that's this guy. Okay?

13:50:27 22 This one is a top down where the implant is
13:50:32 23 going, and this one is my favorite where it, along the lines
13:50:36 24 of where the implant goes, it wraps it up, opens it up into
13:50:42 25 a rectangular image. This is actually a circular image in

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13:50:47 1 there. The green and the red and the blue lines represent
13:50:52 2 the slices. And on a good day, I can understand this, on a
13:50:58 3 bad day, I can't. It's very complicated to make sense of
13:51:02 4 exactly what the geometry and what is that enveloping, but
13:51:07 5 this is a tool that the doctors have at their disposal. And
13:51:12 6 it's got other things, too.

13:51:14 7 Q. You see there that we highlighted or called out the
13:51:18 8 number, the characters on the bottom of the screen, HU-361.
13:51:23 9 What is that?

13:51:24 10 A. So this box right here, HU-361, that's Hounsfield
13:51:29 11 Unit 361. If you also look, the mean value in the inside is
13:51:35 12 also 361. So the Hounsfield Unit on the inside is
13:51:39 13 represented by this tool to the doctor that he's dealing
13:51:43 14 with a bone that's of Hounsfield Unit 361. And further
13:51:47 15 more, they have a selection of density colors. So that has
13:51:54 16 been described, which I believe I have.

13:51:57 17 Q. Let's go back here. So this is right out of the
13:52:00 18 manual. Go ahead, I'm sorry, can you --

13:52:03 19 A. So that density coloring is explained right there in
13:52:07 20 the manual. It says use the density colors option to enable
13:52:12 21 pseudo coloring of data to enhance differentiation between
13:52:16 22 different anatomy densities. That's actually densities, the
13:52:22 23 densities of the material, densities of the bone.

13:52:27 24 Q. What data does the Planmeca ProMax system use to
13:52:32 25 generate that density?

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13:52:34 1 A. The Hounsfield Unit, the Hounsfield Units are
13:52:36 2 captured in volume.

13:52:38 3 Q. Do you see here on the bottom there is a series of
13:52:42 4 numbers explaining what's on the screen?

13:52:44 5 A. Yes, sir.

13:52:44 6 Q. Do you see that.

13:52:45 7 Do you see that number ten, it's pointing to the
13:52:49 8 box that is density colors. Do you see the colors
13:52:55 9 corresponding to HU values and dialogue to adjust them. Do
13:52:59 10 you see that?

13:52:59 11 A. Yes, sir, I do.

13:53:00 12 Q. What does that mean?

13:53:01 13 A. So it's assigning colors to different ranges of
13:53:07 14 Hounsfield Units, different Hounsfield Units. And it's
13:53:11 15 saying that there are densities, the Hounsfield Units are
13:53:15 16 densities.

13:53:16 17 Q. How is it saying that?

13:53:17 18 A. Well, I mean, there is density colors, and it's
13:53:21 19 mapping it to HU values. So to me it's density.

13:53:22 20 Q. So is this telling practitioners, dentists, that
13:53:32 21 Planmeca is telling them that the HU value, the Hounsfield
13:53:41 22 Unit values represent densities?

13:53:42 23 A. Yes, sir, it does.

13:53:43 24 Q. Bone density?

13:53:44 25 A. Yes, sir, bone density.

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13:53:59 1 Q. This is another screen, right. Do you recognize
13:54:03 2 this?

13:54:05 3 A. Yes, sir.

13:54:07 4 Q. What are we looking at here?

13:54:09 5 A. So this is the other software, I believe this was
13:54:17 6 part of the tutorial animation that was available in the
13:54:21 7 Planmeca website. What we see here just by itself is the
13:54:28 8 slices through the volume that was captured. So we talked
13:54:32 9 about the sagittal slice before, so if you want a slice like
13:54:39 10 this, this is if you think of it, it goes right across. So
13:54:44 11 you see the two mandibles, cutting across, and this is going
13:54:50 12 straight down the middle. And this is the surface
13:54:53 13 reconstruction with the hypothetical cut plane shown there.
13:55:01 14 The blue one is this one, the green is that one, and the red
13:55:05 15 is this one.

13:55:05 16 Q. Do you see anywhere on here where the system displays
13:55:09 17 bone density values?

13:55:14 18 A. Let's see. So right there, there is the Hounsfield
13:55:20 19 Unit, it says HU minus 95 because the pointer is pointed to
13:55:24 20 the black. By 3D rendering, right down there. So that is
13:55:40 21 what is used to make the surface. It says hard tissue. And
13:55:47 22 it has variable sliders to do that.

13:55:52 23 Q. Let's try one more before we move on. Another screen
13:55:58 24 shot. What is this, can you describe what we're looking at?

13:56:02 25 A. So this is the implant verification tool again, a

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13:56:06 1 different view. So -- and then you got that density colors
13:56:12 2 there. There is a Hounsfield Unit right there, various --
13:56:22 3 the numbers inside and out, those are all Hounsfield Units,
13:56:26 4 average, mean value of Hounsfield Units.

13:56:31 5 Q. Okay. This screen and the ones before it, does all
13:56:36 6 of this require generation of the tomographic model having
13:56:41 7 bone density data or densitometry?

13:56:43 8 A. Yes, sir, it does.

13:56:44 9 Q. Would it be possible to show this kind of data
13:56:48 10 without generating that model first?

13:56:50 11 A. No, it's not.

13:56:51 12 Q. All right. Let's turn now to the patents.

13:56:51 13 MR. OSTROW: Your Honor, I guess sort of
13:56:59 14 commercial break, letting you know that we're going to move
13:57:02 15 on to another section, it's been about an hour, I leave it
13:57:06 16 up to you how we should proceed.

13:57:08 17 THE COURT: Go ahead. No, I don't know. You
13:57:13 18 guys want to take a break? I'll give you ten minutes or do
13:57:18 19 you want to keep going for a while longer. Okay. We're
13:57:22 20 going for a little while longer. I assume you have about
13:57:27 21 20 minutes left, pretty much.

13:57:28 22 MR. OSTROW: Sorry, each little subject matter
13:57:32 23 we're talking about goes about 20 minutes.

13:57:33 24 MR. OSTROW: Something like that.

13:57:34 25 THE COURT: There you go. Carry on, counsel.

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MR. OSTROW: Okay. Thank you.

BY MR. OSTROW:

Q. All right. Let's turn now to Dr. Massie's patent.

So you explained what Planmeca ProMax systems do. Let's see how they relate to Dr. Massie's patents. Have you formed an opinion about whether any of the claims of Dr. Massie's patents are being infringed?

A. Yes, sir, I have, I have formed the opinion that claims 1 and 7 of this '301 patent infringe. That Claim 1 of the '262 patent infringe. And that claim 1 and 6 of the '374 patent infringe.

Q. Okay. Let's dive in. We got up here claim one of the '301 patent. So are you going to take us through now wherein the Planmeca system you find each of these elements?

A. Yes, sir, I do.

Q. All right. Now, you mentioned earlier about claim constructions?

A. Yes, sir.

Q. Did you take into account any claim constructions that were ordered by the court?

A. Yes, sir, I did.

Q. We're showing here on slide 39 what's in the jury book. These are the claim constructions that the jurors have in their books?

A. Yes.

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13:58:47 1 Q. You see that for example, the claim term
13:58:52 2 tomographically modeling was defined by the court, you're
13:58:55 3 going to take all this into account as you show the
13:58:59 4 infringement?

13:58:59 5 A. Absolutely, yes.

13:59:00 6 Q. Let's go. This is the first element, what they call
13:59:03 7 the preamble of claim one, a system for tomographically
13:59:07 8 modeling dental and orthopedic structure densitometry, so if
13:59:11 9 that wasn't a mouth full enough, we got this construction to
13:59:14 10 deal with. Can you explain to the jury what this
13:59:17 11 construction means?

13:59:19 12 A. Absolutely. So the element in claim one, the system
13:59:25 13 for tomographically modeling dental and orthopedic structure
13:59:29 14 densitometry which includes this term tomographic modeling.
13:59:34 15 Tomographic modeling has been construed by the Court to mean
13:59:37 16 something. It's especially long but I think you should go
13:59:40 17 through it.

13:59:41 18 Q. Please.

13:59:41 19 A. Tomographic modeling as is construed by the Court is
13:59:45 20 to mean merging of information from multiple tomographic
13:59:49 21 scans of an object to produce a representation of the
13:59:53 22 subject/said representation depicting quantitative density
13:59:57 23 differences of the object scanned, which is created by the
14:00:00 24 micro processor in the controller using densitometry from at
14:00:03 25 least one focal plane.

14:00:12 1

Q. Okay.

14:00:12 2

A. One note for this is that this exact definition is used in other slightly different terms, so I'm going to refer back to this definition moving forward.

14:00:17 3

14:00:22 4

14:00:25 5

Q. Can you -- let's try to break this down a little bit. Can you take this is in parts and explain what your understanding is of this is?

14:00:28 6

14:00:31 7

14:00:31 8

A. Okay. Sure. So merging information from multiple tomographic scans of an object. This is the projections, the x-ray hits the patient, gets recorded on the detector and we do this hundreds of times. Okay?

14:00:37 9

14:00:42 10

14:00:47 11

14:00:50 12

So that's the tomographic scan. That, those projections are used too make a tomography, so in this process it is scanning, each one radiograph with all the anatomy superimposed on each other, those formulate the scan.

14:00:53 13

14:00:58 14

14:01:02 15

14:01:06 16

14:01:07 17

So the object is the patient anatomy, so we're scanning the patient. And it says produce a representation of the subject/said representation depicting quantitative density.

14:01:10 18

14:01:15 19

14:01:19 20

14:01:20 21

Q. Dr. Kia, so it says to produce a representation of the subject, what does that mean?

14:01:24 22

14:01:26 23

A. So once you take the projections, you take it through Feldkamp algorithm, it back projects, so those radiographs that we took, hundreds of them these rays, back project and

14:01:32 24

14:01:32 25

14:01:43 1 make the volume. That's a representation of the subject.

14:01:46 2 Q. The subject in this case is the patient?

14:01:47 3 A. The patient. Well, actually the particular anatomy
14:01:51 4 of the patient that you're scanning.

14:01:53 5 Q. So in the types of things we have been looking at,
14:01:56 6 would that be like the jaw, the mandible, the teeth?

14:01:59 7 A. Yes, sir, the jaw and the tooth structures, we were
14:02:03 8 talking about dentists using this, those are the anatomy
14:02:06 9 that they're going to operate on.

14:02:08 10 Q. I'm sorry, keep going. What does it mean that the
14:02:11 11 representation depicting quantitative density differences,
14:02:15 12 what is that?

14:02:15 13 A. So, once the representation is available, that
14:02:21 14 representation has to be a quantitative density differences
14:02:25 15 of the subject's skin. So the quantitative density is the
14:02:31 16 calculation, these are the numbers, from the projections
14:02:34 17 that are captured, digitized, to the Feldkamp algorithm, the
14:02:41 18 Hounsfield Unit calibration, all of those are numbers. You
14:02:44 19 take that same input, same data, put it in the processor,
14:02:50 20 you get the same exact answer in the numbers. That is the
14:02:52 21 quantitative density that we're talking about.

14:02:52 22 Q. What does it mean density differences, what is that?

14:02:52 23 A. It's the ability to distinguish different density
14:03:00 24 values.

14:03:02 25 Q. Are we talking, for example, those Hounsfield Unit

14:03:09 1 numbers that change?

14:03:11 2 A. Yes. From hard tissue, from hard bone to soft bone.

14:03:16 3 Q. All right. And the last piece of this, about it

14:03:20 4 being created by the microprocessor and the controller, I

14:03:23 5 guess we'll probably talk about microprocessors and

14:03:27 6 controllers in a minute, right?

14:03:28 7 A. Yes, sir. So the system has a controller unit which

14:03:32 8 consist of microprocessors.

14:03:34 9 Q. And then using densitometry from at least one focal

14:03:39 10 plane, what does that add?

14:03:42 11 A. Well, the ability to at least be able to measure, be

14:03:52 12 able to identify the density for at least one focal plane,

14:03:57 13 you take one voxel and say that's a Hounsfield Unit, that's

14:04:00 14 the density.

14:04:01 15 Q. What's a focal plane?

14:04:04 16 A. Well, that's the -- I mean, any slice with any pixel

14:04:12 17 is a focal plane. Each voxel would satisfy that.

14:04:17 18 Q. Okay. So in your opinion, does the Planmeca ProMax

14:04:23 19 models that we've identified earlier, do they 3D model, are

14:04:29 20 they a system for tomographically modeling dental and

14:04:32 21 orthopedic structure?

14:04:33 22 A. Yes, sir, they do.

14:04:34 23 Q. What about the densitometry, the Court construed

14:04:37 24 densitometry to mean quantitatively calculated bone density.

14:04:42 25 What does that mean?

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14:04:43 1 A. Yeah. So as I explained earlier, from the
14:04:46 2 projections, from the back projection, to the Hounsfield
14:04:51 3 Unit calibration, those are all numbers. They're
14:04:53 4 quantitative. Quantitative means that the quantities are
14:04:56 5 used and math is used to go from one number to the other.
14:05:01 6 So quantitatively they are calculated and they're
14:05:04 7 representing bone density. So that's how that is satisfied.

14:05:08 8 Q. What is it that satisfies -- what is in the Planmeca
14:05:12 9 ProMax 3D models and those systems that satisfies the
14:05:14 10 densitometry limitation?

14:05:17 11 A. The ability of the Hounsfield Unit values that are
14:05:21 12 stored in the volume.

14:05:24 13 Q. So is it your opinion that the Planmeca ProMax 3D
14:05:29 14 systems as written here was a system for tomographically
14:05:35 15 modeling dental and orthopedic structure densitometry?

14:05:38 16 A. Yes, sir, it is my opinion that Planmeca ProMax 3D
14:05:41 17 does that.

14:05:42 18 Q. Let's go to the next element. The first element
14:05:46 19 here, A, is a controller with a microprocessor and memory
14:05:50 20 device connected to the microprocessor. The Court construed
14:05:52 21 a controller as one or more controllers. Do you see that?

14:05:52 22 A. I do.

14:05:53 23 Q. Do you have any understanding as to why a controller
14:06:00 24 would be interpreted to one or more controllers?

14:06:02 25 A. That's just a qualifier, it is a system, a controller

14:06:11 1 within a system because the system works together, it is not
14:06:14 2 different systems working, it's one system working in
14:06:17 3 unison, so that controller system as a whole is the a
14:06:20 4 controller.

14:06:22 5 Q. And then there is this means for storing a
14:06:26 6 preexisting tomographical dental/orthopedic densitometry
14:06:30 7 model?

14:06:31 8 A. That last part looks familiar at this point. What
14:06:34 9 about this means for storing, what is this construction.

14:06:37 10 A. This construction is a means-plus-function
14:06:40 11 limitation. And the with this limitation you have to
14:06:43 12 identify a function and the function is storing the
14:06:46 13 preexisting tomographical dental/orthopedic densitometry
14:06:50 14 model. And the storing has to happen within a structure,
14:06:53 15 and that's the bottom line and that structure is the
14:06:56 16 computer memory.

14:07:00 17 Q. Can I just ask you to explain briefly what do you
14:07:03 18 mean by a means-plus-function limitation?

14:07:06 19 A. So whenever there is means in the claim as we have
14:07:10 20 here, means for storing, you have to identify a structure
14:07:13 21 within the product that performs that. And to be able to
14:07:16 22 identify that we have to point to the description in the
14:07:19 23 patent that what is it that it's doing, what is that
14:07:22 24 function that it's performing. And that function is what's
14:07:25 25 specified, that function is storing a preexisting

14:07:34 1 tomographical dental/orthopedic densitometry model.

14:07:39 2 Q. And then again we see this term, this tomographical
14:07:43 3 dental/orthopedic densitometry model, which is again
14:07:47 4 construed by the Court. Can you walk us through, is this
14:07:50 5 similar to what we just read and explained?

14:07:53 6 A. It is similar to what we just read, that portions,
14:07:58 7 the tomographical dental/orthopedic densitometry model why
14:08:06 8 it's different word, it has meant to have that meaning,
14:08:10 9 which is identified as the same meaning that the covered
14:08:13 10 with the previous element.

14:08:15 11 Q. Let's just take these in parts then. The controller
14:08:17 12 with a microprocessor and a memory device, is that present,
14:08:21 13 are those one or more controllers present in the Planmeca 3D
14:08:25 14 model, the accused systems?

14:08:27 15 A. Yes, sir, it is, the system functions as a whole. I
14:08:31 16 have the example of the controller that is in the ProMax
14:08:34 17 x-ray unit. That is being coordinated with also the
14:08:41 18 microprocessors that are available in the other two PCs,
14:08:44 19 that PCs that I have highlighted. These units work together
14:08:50 20 as the controller.

14:08:52 21 Q. So the one or more controllers have components in the
14:08:55 22 ProMax imaging devices, is that right?

14:08:57 23 A. That's correct.

14:08:59 24 Q. The microprocessor and a memory in there?

14:09:00 25 A. Yes, sir, there is.

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14:09:01 1 Q. Each of these computers, the reconstruction PC and
14:09:04 2 the Romexis computer, they both also have microprocessors in
14:09:08 3 the memory?

14:09:09 4 A. That's correct, they do.

14:09:10 5 Q. Is it your understanding, do you have an
14:09:12 6 understanding whether the Planmeca sells this system in this
14:09:16 7 form as a whole?

14:09:18 8 A. Yeah, that's my understanding, Planmeca sells this
14:09:21 9 system always a whole with those components that are shown.

14:09:24 10 Q. Including the two computers?

14:09:25 11 A. Yes, sir.

14:09:29 12 Q. All right. So have you reached -- spoiler alert.
14:09:31 13 Have you reached an opinion as to whether the Planmeca
14:09:34 14 system has the claim controller?

14:09:38 15 A. Yes, sir, my opinion is that it is included.

14:09:41 16 Q. Okay. What about the means for storing, where is
14:09:45 17 that?

14:09:45 18 A. The means for storing is happening in the PC that's
14:09:51 19 on the very right. That's using the microprocessor in that
14:09:52 20 PC to store the data, the tomographical dental/orthopedic
14:10:00 21 densitometry model.

14:10:00 22 Q. So is it your opinion that that means for storing is
14:10:00 23 present in the system?

14:10:00 24 A. Yes, it's my opinion that it is present.

14:10:10 25 Q. Let's go on to the next element of claim one of the

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14:10:16 1 '301 patent which is an input device connected to the
14:10:19 2 microprocessor. Something is, there is no claim
14:10:24 3 construction to deal with here. Where do you see an input
14:10:27 4 device connected to the microprocessor?

14:10:29 5 A. So, the two input devices are identified as the
14:10:32 6 keyboard on the viewing workstation and also the ProTouch
14:10:38 7 display that is on the x-ray unit, both of them are input
14:10:43 8 units.

14:10:43 9 Q. So have you formed an opinion as to whether the
14:10:46 10 Planmeca system accused of infringement, whether that
14:10:49 11 includes this element, the input device?

14:10:51 12 A. Yes, sir, it is my opinion that it is included.

14:10:54 13 Q. All right. Let's move on to to element C of the
14:10:57 14 claim. A positioning motor connected to the microprocessor
14:11:03 15 and moveable in response to from said microprocessor. Do
14:11:06 16 you see that?

14:11:06 17 A. Yes, sir, I see that.

14:11:08 18 Q. It looks like from the holding that there was an
14:11:11 19 element construed by the Court. Do you see that?

14:11:13 20 A. I do see that, sir.

14:11:15 21 Q. What was that construction?

14:11:15 22 A. The construction for moveable in response to from
14:11:18 23 said microprocessor is to mean moveable in response to
14:11:21 24 signals from said microprocessor.

14:11:24 25 Q. What happened there, how is that different? How is

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14:11:30 1 the construction different than what's in the claim?

14:11:33 2 A. That that there is a signal, there is a signal from
14:11:37 3 the microprocessor to the motors.

14:11:39 4 Q. All right. Have you found anything in the Planmeca
14:11:44 5 system that corresponds to this claim positioning motor?

14:11:48 6 A. Absolutely, yes, sir. So the image in the middle
14:11:52 7 generally shows the top down view, some of the components
14:11:56 8 that are in the machine, including you go some of the
14:12:01 9 motors, but more importantly, the one on the very right at
14:12:04 10 the very top it shows that the motors, those two motors,
14:12:09 11 they're actually connected to the even coders to know
14:12:13 12 exactly where the positions are. And that is signal from
14:12:17 13 down here which is connected to the CPU. So they're
14:12:21 14 microprocessor signals.

14:12:25 15 Q. Okay. And I'm sure, what is the image in the middle
14:12:29 16 show?

14:12:33 17 A. The placement of various components. So the rotation
14:12:37 18 motor, the position motor that's up there, right down there,
14:12:41 19 so the x-ray and the detector is there, so it moves this
14:12:45 20 gantry, be able to move that, it's using that motor that's
14:12:49 21 there.

14:12:53 22 Q. So based on this, have you formed an opinion as to
14:12:57 23 whether the Planmeca system includes a, the positioning
14:12:59 24 motor as claimed?

14:12:59 25 A. Yes, sir. That motor is included in the Planmeca

14:13:04 1 product.

14:13:06 2 Q. Okay. Let's go to the next element. The next
14:13:08 3 element is x-ray equipment, including x-ray source and
14:13:12 4 detector. Nothing bolded, so there is no construction to
14:13:17 5 deal with, but do you know whether the Planmeca ProMax 3D
14:13:21 6 system includes this element?

14:13:24 7 A. Yes, sir, it does. As I have shown the cover is
14:13:29 8 taken off, the image inside the manual, the sensors is
14:13:32 9 denote had by the pointer and on the other side is the x-ray
14:13:37 10 and even I can see part of the, potentially of what the
14:13:41 11 x-ray as it's exiting the x-ray unit.

14:13:49 12 Q. What sensor do you think Planmeca ProMax 3D system?

14:13:51 13 A. The Varian sensor, I believe it's next generation,
14:13:59 14 Varian from the one I use, but it's a sensor made by Varian.

14:14:04 15 Q. And when you say the one you use, are you referring
14:14:07 16 to what we discussed this morning about the work you did at
14:14:11 17 Imaging Science?

14:14:12 18 A. Yes, sir.

14:14:13 19 Q. So based oh this, have you formed an opinion as to
14:14:16 20 whether Planmeca ProMax 3D system includes this claimed
14:14:21 21 x-ray component?

14:14:21 22 A. Yes, sir, it is my opinion that Planmeca includes
14:14:24 23 this element.

14:14:26 24 Q. All right. Next element in claim 1 is this
14:14:30 25 conversion means for converting a signal from said detector

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14:14:34 1 array, that conversion means being connected to said
14:14:38 2 detector array and to said microprocessor. There is some
14:14:42 3 bowled go here. There is a construction, can you walk us
14:14:44 4 through what this construction is?

14:14:46 5 A. Absolutely, the conversion means is also a
14:14:48 6 means-plus-function limitation. And just like before with
14:14:52 7 the other means-plus-function, the function in here is
14:14:55 8 converting a signal from the detector array. And the
14:15:00 9 structure is the analog to digital converter. So the
14:15:05 10 function is meant to convert the analog signals that are
14:15:11 11 captured in those pixels that we talked about earlier and
14:15:15 12 to convert them into digital data.

14:15:19 13 Q. So does the Planmeca system include such an
14:15:24 14 analog-to-digital converter?

14:15:25 15 A. Yes, sir. From the use of the detectors, the
14:15:29 16 detectors have analog-to-digital converters inside them, so
14:15:31 17 they utilize that feature to get the digital data.

14:15:34 18 Q. When you say detectors, are you referring again to
14:15:41 19 those Varian sensors?

14:15:42 20 A. Yes, sir, those Varian sensors of different sizes.
14:15:47 21 We can see at least two sizes here, 13 by 13 and an 8 by 13.

14:15:51 22 Q. Why are there different sizes shown?

14:15:54 23 A. Well, for this particular example, it's the size of
14:15:59 24 the volume that you're scanning, so the 8 by 13 would scan a
14:16:03 25 smaller volume than a 13 by 13.

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14:16:06 1 Q. Is this related to the thing we discussed earlier
14:16:09 2 about the different ProMax 3D models?

14:16:11 3 A. Yes, sir, this would dictate that differences.

14:16:15 4 Q. How they capture different sizes depending on the
14:16:18 5 sides of the sensor, is that what you're talking about?

14:16:21 6 A. Absolutely, yes.

14:16:22 7 Q. Based on this, have you formed an opinion whether the
14:16:24 8 Planmeca ProMax 3D system includes the claimed conversion
14:16:28 9 means?

14:16:28 10 A. Yes, sir, it is my opinion that Planmeca includes
14:16:31 11 this limitation.

14:16:31 12 Q. All right. And finally, the last element of claim 1
14:16:34 13 is an output device connected to said microprocessor and
14:16:40 14 adapt had for receiving a tomographical densitometry model
14:16:44 15 from said microprocessor. Since output is bolded, so there
14:16:49 16 is a claim construction. Can you walk us through, what is
14:16:52 17 this claim construction?

14:16:53 18 A. Absolutely, so the claim construction is defining the
14:16:58 19 term an output device to mean one or more output devices
14:17:02 20 connected to said microprocessor and adapted for receiving a
14:17:06 21 tomographic model/tomographical densitometry model from said
14:17:11 22 microprocessor.

14:17:14 23 Q. So if I'm reading this right, it's again sort of that
14:17:19 24 an output device got construed as one or more output devices
14:17:24 25 like the controller, is that what happened?

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14:17:26 1 A. That's correct, yes, sir.

14:17:28 2 Q. All right. And have you found any output devices
14:17:30 3 that meet this requirement in the Planmeca ProMax 3D stem?

14:17:36 4 A. Absolutely as we noted in the portion of the ProMax
14:17:41 5 system, it that's this tomographic densitometry model and
14:17:49 6 displays that, so it is in the limitation specified.

14:17:53 7 Q. Although the output devices, any of those, are they
14:17:57 8 adapted, the claim says adapted for receiving tomographic
14:18:01 9 densitometry model?

14:18:02 10 A. Yes, sir, the software in there is adapted so that it
14:18:05 11 can receive the model when the reconstruction is con, when
14:18:10 12 it's ready to receive.

14:18:11 13 Q. So based on this, have you formed an opinion whether
14:18:14 14 the Planmeca ProMax 3D systems include this claimed element,
14:18:18 15 output device?

14:18:19 16 A. Yes, in my opinion the Planmeca products meet this
14:18:23 17 limitation.

14:18:24 18 Q. All right. We have gone through all the elements.
14:18:27 19 So now, I'm going to ask you whether, do you have an opinion
14:18:31 20 whether claim 1 of the '301 patent is -- includes all -- the
14:18:32 21 Planmeca 3D system includes all the elements of claim 1?

14:18:40 22 A. Yes, sir, it is my opinion that Planmeca products
14:18:42 23 include all the elements of claim 1.

14:18:44 24 Q. And do you have an opinion as to whether claim 1 is
14:18:48 25 being infringed by Planmeca?

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14:18:50 1 A. Yes, sir, in my opinion claim 1 of the '301 patent is
14:18:53 2 infringed by Planmeca.

14:18:55 3 MR. OSTROW: Your Honor, I got one more claim to
14:18:59 4 sneak in if you don't mind.

14:19:00 5 THE COURT: Okay. Sure.

14:19:01 6 MR. OSTROW: Before the break.

14:19:02 7 THE COURT: That's fine.

14:19:03 8 BY MR. OSTROW:

14:19:04 9 Q. All right. In this patent, you also said that you
14:19:07 10 had an opinion about dependent claim 7. So before we just
14:19:11 11 explain, I think we have seen some of this in the video the
14:19:15 12 other day, but what's a dependent claim again?

14:19:18 13 A. Yes, sir. So a dependent claim as in this case,
14:19:22 14 claim 7 is a dependent claim. We can read the first part,
14:19:27 15 the system according to claim 1 is referring, so claim 7 is
14:19:31 16 referring to claim 1. For this claim to be infringed, all
14:19:35 17 the elements of claim 1 has to be infringed which we just
14:19:39 18 showed. But to infringe claim 7, all the elements of claim
14:19:44 19 1 have to be met, plus the addition of the claim elements
14:19:48 20 that specified by this current claim. We're going to go
14:19:52 21 through what is the added limitation of this current claim.

14:19:57 22 Q. All right. Claim 7 says wherein said output device
14:20:00 23 includes a color monitor adapted to receive said
14:20:03 24 tomographical densitometry model output color-coded to
14:20:07 25 represent densitometry. That's kind of a mouth full. What

14:20:11 1 does all that mean?

14:20:11 2 A. So what that means is that at the very beginning, it
14:20:15 3 said said output device, if you remember there was an
14:20:19 4 element that specified an output device. So that output
14:20:23 5 device has an extra limitation which is, includes a color
14:20:26 6 monitor, that's adapted to receive tomographical
14:20:32 7 densitometry model output color coded to represent
14:20:34 8 densitometry, which just basically means that a color
14:20:37 9 monitor is utilized and various values that the deny at this
14:20:41 10 time are interested in are being able to be represented in
14:20:41 11 different colors, so to be able to show maybe hard bone in
14:20:50 12 red, soft bone in blue, whatever the dentist likes.

14:20:51 13 Q. And so I also recognize that screen or at least some
14:20:51 14 of these, especially that one on the left that we were
14:21:01 15 looking at the density codes. Is that an example of an
14:21:01 16 output that's color-coded to represent bone density values?

14:21:10 17 A. Absolutely. The one at the very left has actually
14:21:13 18 that represent density in different colors. The one on the
14:21:20 19 very right shows that before and after of the bone structure
14:21:25 20 in different colors. Even the surface model is represented
14:21:32 21 in different colors.

14:21:32 22 Q. So have you formed an opinion whether the Planmeca
14:21:42 23 ProMax 3D system includes the elements -- includes what's
14:21:45 24 required by claim 7 and therefore infringing claim 7?

14:21:48 25 A. Yes, sir. I concluded that the Planmeca products

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14:21:51 1 include this limitation.

14:21:54 2 MR. OSTROW: With that, Your Honor, I'm going to
14:21:56 3 move on to another patent.

14:21:57 4 THE COURT: This is a good time for a break.
14:22:00 5 Let's take ten, ladies and gentlemen.

14:22:02 6 COURT CLERK: All rise.

14:22:05 7 (Jury leaving the courtroom at 2:22 p.m.)

14:22:26 8 THE COURT: So we're outside the presence of the
14:22:29 9 jury. We polled the jury on how long they want to take for
14:22:31 10 lunch and I know that we're under the gun with this case, we
14:22:31 11 need to get it done within the time frame that's allotted.
14:22:41 12 So I asked them, I'm going to give you all the basis. See
14:22:41 13 the basis of my opinion. So we asked them whether they want
14:22:51 14 to do an hour, forty-five minutes or a half an hour. They
14:22:51 15 picked forty minutes. So we'll take forty minutes for lunch
14:23:01 16 from here on out. We're in recess.

14:23:01 17 (A brief recess was taken.) .

14:36:40 18 COURT CLERK: All rise.

14:36:41 19 (Jury entering the courtroom at 2:36 p.m.)

14:36:52 20 THE COURT: Please be seated, ladies and
14:37:02 21 gentlemen. Are you ready?

14:37:22 22 MR. OSTROW: Yes, Your Honor.

14:37:22 23 THE COURT: If the Doctor would come back up.
14:37:42 24 You may continue.

14:37:42 25 MR. OSTROW: Thank you, Your Honor.

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14:37:46 1

BY MR. OSTROW:

14:37:47 2

Q. Dr. Kia, let's turn to another patent. The '262 patent. Okay?

14:37:51 3

14:37:52 4

A. Yes, sir.

14:37:53 5

Q. I have got up here in the slide 3, claim 1 of the patent?

14:37:59 6

14:37:59 7

A. Yes, sir.

14:37:59 8

Q. Let's do the same analysis, element by element. Okay?

14:38:02 9

14:38:03 10

A. Absolutely. Yes, sir.

14:38:05 11

Q. So claim 1 of the '262 patent starts, a digital modeling system for creating dental or orthopedic models of patients, do you see that?

14:38:10 12

14:38:14 13

A. I do see that, yes, sir.

14:38:15 14

14:38:16 15

Q. Is the Planmeca ProMax 3D system a digital modeling system?

14:38:21 16

14:38:21 17

A. Yes, sir, it is.

14:38:22 18

Q. And is it for creating dental or orthopedic models of patients?

14:38:27 19

14:38:27 20

A. Yes, sir, it is.

14:38:28 21

Q. Is it your conclusion that the Planmeca 3D ProMax system meets this element of claim 1?

14:38:33 22

14:38:34 23

A. Yes, it's my opinion that the Planmeca ProMax 3D system meets this claim.

14:38:39 24

14:38:42 25

Q. The first element of the '262 patent claim 1 is a

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14:38:46 1 computer including a digital memory storing patient
14:38:50 2 densitometry information, an input and an output. Do you
14:38:53 3 see that?

14:38:53 4 A. Yes, sir, I do see that.

14:38:54 5 Q. And again we've got densitometry which is being
14:38:57 6 construed by the Court as meaning quantitatively calculated
14:39:01 7 bone density correct?

14:39:02 8 A. Yes, sir.

14:39:03 9 Q. So what in the Planmeca ProMax 3D system corresponds
14:39:09 10 to this claim of a computer?

14:39:14 11 A. The computer, it does the computing portion of what I
14:39:20 12 showed there from the Planmeca limitation is that the
14:39:25 13 circuit board that's on the ProMax x-ray system and also the
14:39:32 14 PC that's on the station.

14:39:39 15 Q. Is this a computer, are you reading this similar to
14:39:42 16 what we saw before, like input controller and output device,
14:39:48 17 that's one or more?

14:39:49 18 A. Yes, sir, that's one or more.

14:39:51 19 Q. And do these one or more computers in the Planmeca
14:39:55 20 system, do they store patient densitometry information?

14:39:57 21 A. Yes, sir, they do.

14:39:59 22 Q. Okay. And in this sense, is this what you described
14:40:04 23 earlier in terms of the bone density data as Hounsfield
14:40:08 24 Unit?

14:40:09 25 A. Yes, sir, exactly as I described earlier.

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14:40:10 1 Q. And the input and output devices, what are those?

14:40:13 2 A. Yes. The input devices that are shown is a keyboard
14:40:19 3 and the display, and the output device is the display and
14:40:27 4 also the workstation computer.

14:40:30 5 Q. All right. So have you formed an opinion whether the
14:40:33 6 Planmeca ProMax 3D system includes this claim computer
14:40:37 7 element?

14:40:38 8 A. Yes, sir, my opinion is the Planmeca ProMax 3D system
14:40:44 9 meets claim -- this claim element.

14:40:47 10 Q. All right. Let's go to the next element, the '262
14:40:51 11 patent, dental or orthopedic input device including an
14:40:54 12 energy source and an energy sensor; said source and said
14:41:01 13 sensor being placed with at least a portion of the patient's
14:41:04 14 dental or orthopedic structure there between. What's going
14:41:08 15 on here?

14:41:08 16 A. Yes, sir. So the input device as shown has the
14:41:13 17 energy sensor and the energy source and you take the place,
14:41:17 18 the cover off, you see the sensor and, tool as described
14:41:24 19 earlier in the previous claim, along with the top view.
14:41:30 20 It's at least a portion of the dental, the patient dental
14:41:34 21 orthopedic structure is there, and the patient is shown on
14:41:38 22 the very right.

14:41:42 23 Q. All right. So the source and the sensor are placed
14:41:46 24 so that the patient's mouth, head could be placed in between
14:41:50 25 them, is that what's happening?

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14:41:55 1 A. That's correct. The gantry is made such that the
14:41:58 2 x-ray source and sensor is in between.

14:42:02 3 Q. And the energy source here and energy sensor, I don't
14:42:05 4 remember this terminology from the last claim. What is this
14:42:09 5 referring to?

14:42:10 6 A. The energy source is a source of analyzing radiation,
14:42:17 7 so some sort of radiation that penetrates the body and
14:42:21 8 sensor is the one that can take that radiation and convert
14:42:25 9 it to digital value.

14:42:26 10 Q. When you say "analyzing radiation", you're talking
14:42:30 11 about x-rays?

14:42:30 12 A. We're talking about x-rays, yes, sir.

14:42:31 13 Q. Have you formed an opinion whether the ProMax
14:42:35 14 Planmeca 3D system includes this element of claim 1, an
14:42:39 15 dental or orthopedic input device?

14:42:41 16 A. Yes, sir, the Planmeca ProMax 3D meets that claim
14:42:44 17 limitation.

14:42:47 18 Q. Let's go on to the next element which is element C of
14:42:50 19 claim 1, said sensor transferring signals to the computer
14:42:53 20 inputs, said signals representing densitometry of the
14:42:57 21 patient's dental or orthopedic structure. What's going on
14:43:00 22 with this element?

14:43:02 23 A. Yes, sir. See the densitometry as it's construed by
14:43:05 24 the Court as we discussed earlier. So quantitatively
14:43:12 25 calculated density I believe is what the term was. And so

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14:43:19 1 this element says that the sensor is transferring the
14:43:23 2 signals to the computer input and that said signals
14:43:28 3 represent density of the patient's dental and orthopedic
14:43:33 4 structure as we discussed a number of times before.

14:43:38 5 Q. What signals in this case are being transferred out
14:43:42 6 of the sensor that represent densitometry on the patient?

14:43:49 7 A. This would be the tomographic scan, it would be the
14:43:54 8 projection.

14:43:55 9 Q. So have you formed an opinion whether Planmeca ProMax
14:44:00 10 3D system includes this element, this sensor?

14:44:04 11 A. Yes, sir, the Planmeca ProMax 3D system meets this
14:44:08 12 claim limitation.

14:44:11 13 Q. All right. The next element of claim 1, element D,
14:44:14 14 said computer creating, storing and, transferring three
14:44:17 15 dimensional densitometry models, without the use of fiducial
14:44:21 16 markers of patient dental or orthopedic structure. Do you
14:44:24 17 see that?

14:44:26 18 A. I do see that.

14:44:29 19 Q. Again we got the word densitometry. So that's
14:44:32 20 quantitatively calculated bone density, right?

14:44:34 21 A. That's correct, that's defined by the Court.

14:44:37 22 Q. Have you found a computer or one or more computers in
14:44:41 23 the Planmeca system that perform this function?

14:44:44 24 A. Yes, sir, the recon PC and the visualization PC in
14:44:47 25 combination creates, store and compare the three dimensional

14:44:56 1 digital model.

14:44:57 2 Q. Now, do you know the name, I think I asked you this
14:45:00 3 before. Does the software on the reconstruction PC have
14:45:04 4 some sort of name?

14:45:05 5 A. Not really. It's just a recon PC, and the manuals.
14:45:10 6 I do know that the Romexis software is made so that it can
14:45:15 7 receive that data. So a portion of that program has a
14:45:21 8 Romexis footprint on it, so it has to be able to connect to
14:45:25 9 receive the data.

14:45:26 10 Q. So are you saying that there is some portion of
14:45:29 11 Romexis software in the way you analyzed this running on the
14:45:32 12 reconstruction PC?

14:45:33 13 A. Yes, sir.

14:45:35 14 Q. What is this language, this doesn't look like
14:45:39 15 something we've seen before, this element says something
14:45:43 16 about without the use of fiducial markers, do you see that,
14:45:47 17 of patient dental or orthopedic structure, what does that
14:45:50 18 mean?

14:45:51 19 A. Well, for the comparing of the three dimensional,
14:45:54 20 densitometry models, so if you're going to go compare one
14:45:57 21 with the next, we can always put a marker, actually put like
14:46:01 22 a little B B or a little steel ball so that when you do the
14:46:04 23 scan, you match the two steel because and it can register
14:46:11 24 them together to be able to compare it.

14:46:13 25 So what this requirement is without that use to

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14:46:17 1 be able to match and be able to compare the data set.

14:46:21 2 Q. Sorry, what's a fiducial marker, what's that mean?

14:46:24 3 A. A Fiducial marker is something in the scan field that
14:46:28 4 the computer can identify, and reference it across different
14:46:34 5 data sets.

14:46:37 6 Q. And this is something you put in a patient's mouth?

14:46:41 7 A. Yes, something like a B B or some sort of a marker, I
14:46:45 8 mean, since we're talking about computer tomographic, a
14:46:48 9 little ball, a little steel ball being placed, preferably
14:46:54 10 not in the area of where the anatomy, but somewhere far off
14:46:58 11 to be able to register it, so without the use of that.

14:47:01 12 Q. So how do you know that the Planmeca three doctor,
14:47:06 13 ProMax 3D systems don't make use of fiducial markers?

14:47:10 14 A. Well, the material that I have seen, the user manuals
14:47:16 15 can do that step, can register the two data sets and compare
14:47:21 16 the before and after. I believe it even had an image on the
14:47:26 17 previous slide that showed that.

14:47:27 18 Q. Previous slide. This one?

14:47:29 19 A. No, the one before.

14:47:31 20 Q. All right.

14:47:32 21 A. No, it was associated with this one, it was not this
14:47:35 22 one. My mistake.

14:47:37 23 Q. What about the screen shots here, do they show it?

14:47:41 24 A. So, this one, the one on the right shows the
14:47:44 25 comparison with the right and left TMJ, so these are the

14:47:54 1 TMJ's, so with respect to the right and the left, and at
14:48:06 2 different angulations. So this is one slide, another slide
14:48:11 3 compared to one slide to another slide. So the comparison
14:48:16 4 in this particular data set is the right to the left. Not
14:48:21 5 different scans.

14:48:22 6 Q. And the comparison here for each of these pairs of
14:48:26 7 images, these are from two different tomographic models?

14:48:30 8 A. Actually this one is from one tomographic model.
14:48:34 9 There is another one that we had.

14:48:37 10 Q. How does the -- what role does the computer play in
14:48:41 11 doing the comparing?

14:48:42 12 A. So, with the comparing, when you have the before and
14:48:46 13 after tomograph, the computer does a lot of steps. So the
14:48:51 14 first thing it does is that for one it has to organize the
14:48:54 15 patient, the same patient has to have at least two
14:48:58 16 tomographs. The database, storage of that is necessary.
14:49:02 17 Then the second part is that both data sets have to be
14:49:06 18 loaded. So this totally different from loading one data
14:49:10 19 set, you have to have the memory to be able to load both of
14:49:14 20 them so the doctor can go to one from the other. The third
14:49:18 21 one if you're viewing some anatomy, even side-by-side, you
14:49:22 22 need to be able to compare Apples and Apples, so that same
14:49:26 23 view of that same anatomy has to be presented, so regardless
14:49:30 24 of how, what comparing you do up to that point, you need to
14:49:34 25 be able to go there. And then the last one, the previous

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slide that we showed, if you stay there, that slide was related to this. If you can see, this patient had surgery and it had plates there and also there. I had similar surgery myself, I have a plate by my nose where my maxilla was broken and moved. So with this type of a surgery, the mandible and the maxilla would move so the doctor would have a before and after tomography to compare, that take what I wanted to fix. In my particular case, I had a bad bite, so my tooth were on top of each other, and so the doctor moved it to the front to correct my bite. So this is something that a doctor would want to use, the before and after to see how it helped the patient.

Q. Have you formed an opinion whether the Planmeca ProMax 3D system includes this element D of claim 1 of the computer creating, storing, and carrying three dimensional densitometry models?

A. Yes, in my opinion, the Planmeca ProMax 3D meets this claim limitation.

Q. Then we have I think finally, yeah, so finally, the last element of claim 1 is an output device connected to said computer output and communicating densitometry model comparison information; imaging software associated with said computer; and a display associated with said output device and displaying information pertaining to said densitometry model. So there is a lot there. Can you walk

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us through, can you break this down for us and walk us through where it is that you find this, or if -- I see there is a claim construction again, an output device, what is this?

A. Yes, I believe this is the same output device that was construed earlier, but I trust this one so I'm going to read it. So for claim 1, element E, an output device as is construed by the Court is one or more output devices connected to said microprocessor and adapted for receiving a tomographic model/tomographical densitometry model from said microprocessor.

So the visualization, the next slide, the visualization is that output device, it receives that tomographic model, this is the 3D that's constructed, that model is ready. And it has communicated the densitometry model and the comparison information and the imaging software associated with that said computer is actually visually. This is the image that I was talking about earlier. But let me finish the rest of the claim. And the display associated with said output device and displaying information pertaining to said densitometry model.

Q. Do you know where these images came from?

A. Yes, these images are from the Planmeca manuals. And Planmeca sources. Their website, the material that I mentioned earlier. And one other thing when we were talking

14:53:05 1 about comparison, that particular image was not there, this
14:53:08 2 is the image I was talking about. If you don't mind I would
14:53:12 3 like to explain.

14:53:13 4 Q. Please, go ahead, explain what we're looking at?

14:53:16 5 A. Absolutely. That patient that I showed you that had
14:53:20 6 the metal, so as you see this area is blurry from that far,
14:53:25 7 you don't see, but there are actually two sets of data
14:53:28 8 there, there is a before and after, and they're colored
14:53:31 9 differently and it shows that the movement of both the
14:53:34 10 maxilla and the mandible is shown on top of each other, you
14:53:38 11 see the super imposition.

14:53:41 12 Q. I'm sorry, where do you see the super imposition?

14:53:50 13 A. Well, you have the mandible to mandible.

14:53:57 14 Q. Okay. And what role does the computer play in
14:54:01 15 generating that super imposition?

14:54:03 16 A. Well, as I explained earlier it loads the two data
14:54:07 17 sets from the same patient. As you can see the back bone,
14:54:11 18 the back head is in focus, so it's registered against the
14:54:15 19 two and shows that the difference of the area that the
14:54:19 20 dentist operated on.

14:54:22 21 Q. All right. So in your opinion, do the Planmeca
14:54:26 22 ProMax 3D systems include this output device imaging
14:54:30 23 software and display as in the claims?

14:54:33 24 A. Yes, in my opinion the Planmeca ProMax 3D meets this
14:54:37 25 claim limitation.

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14:54:41 1 Q. We have gone through all the elements of claim 1 of
14:54:43 2 the '262 patent. Is it your opinion that the Planmeca
14:54:48 3 ProMax 3D system includes every element of this claim?

14:54:51 4 A. Yes, sir, it is my opinion that it includes every
14:54:55 5 element.

14:54:55 6 Q. Is it your opinion that this Planmeca ProMax 3D
14:54:58 7 system infringes this claim?

14:55:00 8 A. Yes. That's my opinion.

14:55:02 9 Q. Thank you. Let's go on to the final, third and final
14:55:06 10 patent. Actually before we do, I wanted to ask you a
14:55:10 11 question related to that '262 patent?

14:55:13 12 A. Yes.

14:55:14 13 Q. Way earlier, it seems like a lifetime ago, earlier
14:55:17 14 today, there was I think a brief discussion about the nature
14:55:20 15 of the three patents, and how is the '262 patent related to
14:55:24 16 the original '301 patent?

14:55:28 17 A. Absolutely. So earlier, briefly, it was mentioned
14:55:31 18 that the '262 patent is a continuation in part of the '301.
14:55:34 19 So the '301 has a priority date when it was filed, December
14:55:40 20 of 1999. The '262 was filed a lot later. But it used that
14:55:50 21 original concept, the original writing. What happened at
14:55:53 22 that time is that additional material was written,
14:55:56 23 additional detail into the written description so it's a
14:56:00 24 continuation in part. And claims were added. So claim 1 of
14:56:05 25 the '262 is from the old material, not the new material. So

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with that, claim 1 enjoyed the priority date of December 1999, whereas if it was based on the new material would have had the later date.

So this is a continuation in part.

Q. Thank you.

Let's go to the '374 patent. How does the '374 patent relate to the two other patents?

A. Absolutely. That's a very good question, too. So along with that continuation in part, there is another thing called discontinuation. Where the patent uses the same exact disclosure of the original patent, so the December 1999. So the '374 patent while it was filed after '262, it removed the new contents. So the content that's there was from the original '301 patent. So all of the claims that are added to this '374 patent is from the original disclosure, original written description. So claim 1 of the '374 while it was filed much later it enjoys the December 1999 priority date.

Q. All right. Thank you. Let's see if we can get through this quickly. It looks like familiar territory already. This is claim 1 of the '374 patent. It starts off with a system for tomographically modeling a dental structure, right and the words tomographically modeling have been construed. Right, do you see that?

A. Yes, this is the same construction as in the '301,

14:57:53 1 similar term.

14:57:58 2 Q. And in particular, and has been pointed out earlier

14:58:03 3 today, the word densitometry does not appear in the claim.

14:58:06 4 Right?

14:58:06 5 A. That's correct.

14:58:07 6 Q. But it's in the construction?

14:58:08 7 A. It's in the construction, yes, sir.

14:58:10 8 Q. So what does that mean?

14:58:11 9 A. That means that the meaning of that term includes
14:58:17 10 densitometry, it includes as you can see at the very bottom,
14:58:21 11 controller using densitometry from at least one focal plane.
14:58:24 12 And the second line, representation depicted quantitative
14:58:31 13 density differences, so that interpretation while it doesn't
14:58:34 14 have the density in the element, it includes it in the Court
14:58:41 15 ordered meaning of that term.

14:58:44 16 Q. So given that you've addressed this before, is it
14:58:51 17 your opinion that the -- the first part of claim 1 of the
14:58:57 18 '374 patent is included in the Planmeca ProMax 3D system?

14:59:01 19 A. Yes, sir, as I analyzed before, the Planmeca ProMax
14:59:05 20 3D system meets this claim limitation.

14:59:08 21 Q. Because it's a system for tomographically modeling a
14:59:12 22 dental structure and it does densitometry because it
14:59:16 23 captures the Hounsfield Units representing bone density, is
14:59:20 24 that right?

14:59:20 25 A. That's correct.

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14:59:24 1 Q. We got a controller which, as we said before, is one
14:59:29 2 or more controllers?

14:59:30 3 A. That's correct.

14:59:31 4 Q. And then again the storing element which actually is
14:59:37 5 not a means for storing, adapted for storing, skip that, we
14:59:42 6 got the tomographical models of the dental structure, what
14:59:47 7 is this construction?

14:59:48 8 A. This is the same construction as the previous
14:59:50 9 element, merging information of multiple tomographic scans
14:59:54 10 of an object to proceed cues representative of subject bone
14:59:59 11 density.

14:59:59 12 Q. Is it of your opinion that the Planmeca ProMax 3D
15:00:02 13 systems includes this claim controller?

15:00:04 14 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:00:09 15 3D meets this limitation.

15:00:10 16 Q. And can you just remind us, you have been through
15:00:14 17 this before, where this is?

15:00:17 18 A. Yes. So the controller is at least in the element as
15:00:24 19 I have shown here in the circuit diagram and the in the PCs
15:00:30 20 that are included with the system.

15:00:32 21 Q. Okay. So we move on to the second element. Said
15:00:36 22 controller being adapted to remember storing computed
15:00:40 23 tomographic models of a dental structure. Is this element
15:00:43 24 present in the Planmeca ProMax 3D system?

15:00:47 25 A. Yes, sir, as described earlier this element is

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15:00:49 1 present in the Planmeca ProMax 3D.

15:00:52 2 Q. Where is it?

15:00:53 3 A. That's what's circled, it's the workstation, addition
15:00:59 4 tall eggs workstation.

15:01:02 5 Q. Is it your opinion that the Planmeca ProMax 3D
15:01:06 6 systems include this claim controller being adapted for
15:01:09 7 storing?

15:01:09 8 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:01:11 9 3D adapts the claim limitation.

15:01:14 10 Q. How is the controller adapted, I know that word came
15:01:17 11 up before, what makes it adapted for storing?

15:01:20 12 A. Well, as it's running the Romexis software that has a
15:01:23 13 footprint of the recon that's expected to receive that data.

15:01:30 14 Q. The next element is an input device connected to a
15:01:41 15 microprocessor. It seems like we have seen this before.
15:01:45 16 Have you found input devices in the Planmeca ProMax 3D
15:01:51 17 system?

15:01:51 18 A. Yes, as discussed earlier, the input devices as I
15:01:55 19 have highlighted are the keyboard, ProTouch panel, and also
15:01:59 20 the x-ray unit that provides the data into the recon PC.

15:02:00 21 Q. So is it your opinion that the Planmeca ProMax 3D
15:02:10 22 system includes this claimed input device?

15:02:12 23 A. Yes, it's my opinion that the Planmeca ProMax 3D
15:02:16 24 system meets this claim element.

15:02:19 25 Q. The next element is again this positioning motors to

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15:02:23 1 the microprocessor and responsive to commands. This looks
15:02:27 2 familiar, can you walk us through where this is in the
15:02:30 3 Planmeca ProMax 3D system?

15:02:32 4 A. Absolutely. As I discussed before, there is pictures
15:02:34 5 taken from the Planmeca documentation positioning order
15:02:37 6 that's highlighted in the top, the gantry also rotates, it
15:02:44 7 shows that it is responsive to commands from said
15:02:48 8 microprocessor from the red lines that I have highlighted
15:02:50 9 earlier.

15:02:52 10 Q. So is it your opinion that the Planmeca ProMax
15:02:55 11 systems includes this claim positioning motor?

15:02:58 12 A. Yes, it is my opinion that the Planmeca ProMax 3D
15:03:01 13 meet this claim limitation.

15:03:03 14 Q. Okay. All right. Next element is the x-ray
15:03:06 15 equipment, including the x-ray source, a detector array and
15:03:10 16 a restricted beam device. What's a restricted beam device?

15:03:13 17 A. Restricted beam device is a collimator. As the x-ray
15:03:16 18 exits the tube, there is less feeds and constrictors that
15:03:20 19 will block the x-ray. It's very common and it's very
15:03:23 20 methodical because why would you radiate a patient if that
15:03:26 21 x-ray is not being used for imaging. So that columnization
15:03:30 22 is used to focus the x-ray just on the detector where it's
15:03:33 23 used the most. That restricting the beam is actually FDA
15:03:37 24 required for the reasons that why expose somebody without
15:03:40 25 any need, and that's what the restricted beam device is.

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15:03:58 1 Q. Have you found the claimed x-ray equipment including
15:04:01 2 the source, the detector array and the restricted beam
15:04:04 3 device in the Planmeca ProMax 3D systems?

15:04:08 4 A. Yes, sir, I have.

15:04:08 5 Q. Where are they?

15:04:09 6 A. As shown in the gantry and where the source and the
15:04:14 7 detector rotate, as shown here from the Planmeca
15:04:18 8 documentation, there is the source, and on the other side is
15:04:21 9 the x-ray tube head and the restricted beam device.

15:04:24 10 Q. So have you formed an opinion whether the Planmeca
15:04:27 11 ProMax 3D system includes this claim element?

15:04:30 12 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:04:33 13 3D system meets this claim limitation.

15:04:36 14 Q. All right. Second to last element here is the
15:04:40 15 converter for converting a signal from said detector array,
15:04:43 16 said converter being similar to said detector array and said
15:04:46 17 microprocessor. What is this converter referring to?

15:04:50 18 A. This converter is an analog to digital converter. So
15:04:53 19 that the charges that are accumulated under the detector
15:05:00 20 array are digitized and made into numbers and passed on to
15:05:03 21 the next step which is the reconstruction.

15:05:06 22 Q. Have you found this converter in the Planmeca ProMax
15:05:10 23 3D systems?

15:05:13 24 A. Yes, sir, the detectors receives the converters and
15:05:16 25 the recon PC uses the digital data. I have seen this

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15:05:26 1 limitation in the Planmeca ProMax 3D systems.

15:05:30 2 Q. Is this the Varian sensor again that came up earlier?

15:05:34 3 A. Yes, sir, this is as discussed earlier, the Varian
15:05:37 4 sensor.

15:05:38 5 Q. Is it your opinion that the Planmeca ProMax 3D
15:05:41 6 systems include this claimed converter?

15:05:43 7 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:05:46 8 3D systems meet this claim limitation.

15:05:48 9 Q. Okay. We reached the last element of this claim,
15:05:51 10 which is an output device connected to said microprocessor
15:05:54 11 and adapted for receiving a tomographic model from said
15:05:57 12 microprocessor. Have you found this element in the Planmeca
15:06:00 13 ProMax 3D systems?

15:06:04 14 A. Yes, sir, I have.

15:06:05 15 Q. Where is it?

15:06:08 16 A. It's the output devices, the visualization
15:06:11 17 workstation, that's where it is receiving the tomographic
15:06:14 18 model.

15:06:20 19 Q. What about the workstation that is adapted, we have
15:06:23 20 seen that word before, what does that mean?

15:06:26 21 A. So, running the Romexis software again, and that's
15:06:29 22 adapted so that it will receive the data from the recon PC.

15:06:32 23 Q. Okay. So have you formed an opinion whether the
15:06:35 24 Planmeca ProMax 3D systems include this claimed output
15:06:38 25 device?

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15:06:44 1 A. Yes, it is my opinion that the ProMax 3D system
15:06:48 2 includes this claim limitation.

15:06:51 3 Q. Okay. All right. We've gone through all the
15:06:55 4 elements of claim 1 of the '374 patent. We don't have a
15:07:00 5 slide for it. But have you reached an opinion whether the
15:07:02 6 Planmeca ProMax 3D systems accused of infringement, whether
15:07:05 7 they meet all the elements of claim 1 of the '374 patent?

15:07:08 8 A. Yes, sir, I have made the conclusion that the
15:07:11 9 Planmeca ProMax 3D system meets all elements of the claim 1
15:07:14 10 of the '374 patent.

15:07:16 11 Q. Okay. We're on to the final claim, which is this
15:07:21 12 dependent claim six. Again, just remind us again, dependent
15:07:27 13 claim, how does it work?

15:07:28 14 A. Yes, sir. So again, this dependent claim as is cited
15:07:33 15 in the first part, the system according to claim 1, so all
15:07:36 16 of the elements that we just talked about for claim 1 that
15:07:41 17 has been -- that I have shown have been met, claim six
15:07:44 18 requires all that to meet plus the addition of the elements
15:07:48 19 that is specified by claim six. So claim six then, it says
15:07:54 20 wherein, that starts where the new limitation has to be met
15:08:00 21 if claim six is to be infringed.

15:08:04 22 Q. Let's take a look at claim six, so claim six as you
15:08:07 23 say refers back to claim 1. It says the system according to
15:08:11 24 claim 1. Wherein, said controller is adapted for storing a
15:08:15 25 first tomographic model and a second tomographic model; said

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15:08:20 1 first tomographic model is a preexisting patient model; said
15:08:24 2 second tomographic model is a current patient model; and
15:08:27 3 said controller is further adapted to compare said first
15:08:30 4 tomographic model with said second tomographic model. So
15:08:33 5 we've got some claim construction issues here. Can you
15:08:36 6 explain what we're looking at here?

15:08:38 7 A. Absolutely. So this is a new claim term, we have not
15:08:42 8 talked about, see the current patient model, preexisting
15:08:47 9 patient model is to mean a pair of tomographic models
15:08:52 10 obtained during different imaging sessions, the earlier or
15:08:55 11 preexisting model or use as a baseline for comparing with a
15:09:00 12 later or then current patient model.

15:09:05 13 Q. Okay. So have you identified this controller that's
15:09:13 14 adapted for storing and so forth, comparing these two
15:09:18 15 tomographic models, have you identified that in the Planmeca
15:09:22 16 ProMax 3D systems?

15:09:23 17 A. Yes, sir, that would be the visual eggs workstation,
15:09:27 18 the one in the box there right now.

15:09:29 19 Q. That's the visual eggs workstation running the
15:09:32 20 Romexis software?

15:09:32 21 A. That's correct, as I mentioned before.

15:09:35 22 Q. And it looks like this is the same image we looked at
15:09:40 23 earlier, again can you quickly walk us through how this is
15:09:43 24 comparing the preexisting patient model with the current
15:09:45 25 patient model?

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15:09:47 1 A. Absolutely. So as we discussed before, the patient
15:09:51 2 that has the surgery with the metal, this is like a sample,
15:09:58 3 slices through that volume, and these are the comparable
15:10:03 4 data sets. Where the doctor can visualize how much of a
15:10:09 5 change has taken place. And compare the before and after
15:10:14 6 data sets.

15:10:16 7 Q. So have you formed an opinion as to whether the
15:10:20 8 Planmeca ProMax 3D systems include the elements of claim
15:10:26 9 six, the controller that is adapted for storing, the two
15:10:29 10 tomographic models, current and preexisting and being
15:10:33 11 adapted to compare?

15:10:34 12 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:10:37 13 3D system meets this claim.

15:10:39 14 Q. Again, I know we covered this a little bit before,
15:10:43 15 with the earlier claim, but just to remind us, what is it
15:10:46 16 that the controller is doing in the comparison of these two?
15:10:49 17 Is this just being left to the dentist to look at two
15:10:53 18 things, what's happening?

15:10:54 19 A. Oh, no, the system has to do extra steps to be able
15:10:58 20 to enable the user to be able to compare the data. As I
15:11:02 21 described earlier, at least one, you need to be able to
15:11:05 22 manage the patient, you need to have at least the two
15:11:10 23 tomographic models. Second one, be able to load both
15:11:14 24 datasets at the same time on to the system. I mean, the
15:11:19 25 opposite is kind of silly, that you open one data set, close

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15:11:27 1 it, open another one, close it, open the first one, close
15:11:31 2 it, so it is just logical to be able to put both of them up.
15:11:36 3 And as this demonstration shows is that this is literally
15:11:42 4 one data set registered to the other that most of the
15:11:48 5 anatomy is the same, except where the doctor operated. And
15:11:53 6 he can zoom in on that area and see the effects of his
15:11:57 7 treatment. That is the benefit of being able to compare two
15:12:01 8 data sets.

15:12:02 9 Q. You said something about registered, what do you mean
15:12:06 10 by registered?

15:12:07 11 A. Line up the data sets. And the sign of it is back
15:12:12 12 where the back of the head is, I do not see two sets of back
15:12:20 13 bone, I see one set, so the register, but in the front, I
15:12:25 14 see two sets of mandible and maxilla which means that they
15:12:30 15 were removed. So what I mean with registered, when the
15:12:34 16 back, I see only one, there is two data sets on top of each
15:12:37 17 other and they're very close.

15:12:39 18 Q. So based on this analysis, have you formed an opinion
15:12:42 19 as to whether the Planmeca ProMax 3D systems include the
15:12:47 20 elements of claim six?

15:12:48 21 A. Yes, it is my opinion that the Planmeca ProMax 3D
15:12:51 22 includes the elements of claim six.

15:12:52 23 Q. And since you have already concluded that they also,
15:12:56 24 the systems also include the elements of claim 1, have you
15:12:58 25 formed an opinion whether the Planmeca ProMax 3D systems

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15:13:02 1 infringe claim six?

15:13:03 2 A. Yes, sir, it is my opinion that the Planmeca ProMax
15:13:06 3 3D infringes claim six.

15:13:09 4 Q. Thank you.

15:13:10 5 All right. Well, we finished up the
15:13:13 6 infringement analysis. Let me just ask you a general
15:13:15 7 question. With respect to your entire infringement
15:13:17 8 analysis, all five claims, these opinions that you have
15:13:21 9 expressed, have you formed them to a reasonable technical
15:13:24 10 certainty?

15:13:25 11 A. Yes, sir, I have.

15:13:28 12 Q. Okay. So we got here and you mentioned this earlier,
15:13:31 13 you had some opinions to present on the value of
15:13:41 14 Dr. Massie's patents to the Planmeca ProMax 3D systems. Do
15:13:47 15 you recall that?

15:13:47 16 A. I do recall that, yes, sir.

15:13:48 17 Q. What is it -- how did you go about this analysis?

15:13:51 18 A. I analyzed the material that was provided beyond the
15:14:01 19 user manuals and how the system works to also marketing
15:14:02 20 material to what Planmeca thinks its products are valuable,
15:14:12 21 and tried to analyze various components to see how that
15:14:12 22 functionality maps to the invention that Dr. Massie had. So
15:14:32 23 I divided up what I felt was how it would contribute, what
15:14:32 24 portions are responsible for this invention and what are
15:14:42 25 not, and come up with a valuation of contribution of

15:14:49 1 Dr. Massie's invention into these products.

15:14:51 2 Q. Why did you engage in that analysis?

15:14:54 3 A. So part of the damages is to the damages expert, he
15:15:02 4 says what he is good at, and he needs some technical help in
15:15:07 5 terms of well, if this feature has this value, how is it
15:15:12 6 that this feature came about. How is it that it's utilizing
15:15:16 7 the underlying -- the underlying technology that it relies
15:15:22 8 upon, is it related, is it not related, how much of it is
15:15:26 9 related. So I was able to give the technical aspect of that
15:15:30 10 valuation, the technical aspect of the value of the product
15:15:34 11 to the damages expert.

15:15:38 12 Q. Pulling up here a table. Do you recognize this?

15:15:45 13 A. Yes, sir, I do.

15:15:48 14 Q. What is it?

15:15:49 15 A. So, it's a list of features that I considered. And
15:15:54 16 the weight of the feature for fulfilling the entirety of the
15:16:00 17 product. So that first column has up to a hundred. That
15:16:04 18 means that, well these features in my mind when you put them
15:16:10 19 together, that's the ProMax 3D system. And on the right
15:16:14 20 column, it's an an analysis of how much of that is covered
15:16:20 21 by the invention. As you can see, some of them have a
15:16:24 22 value, some of them don't. It is my opinion that two of
15:16:28 23 those things do not effect, the invention does not affect
15:16:32 24 those elements.

15:16:36 25 Q. Can you just quickly walk through this list of

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15:16:39 1 features and just explain briefly what each of these
15:16:42 2 features is meant or what it represents?

15:16:45 3 A. So, the first element is a 3D cone beam computed
15:16:50 4 tomography, 3D CBCT model scan as we talked in length today.
15:16:56 5 So this is that process of taking the projections and doing
15:17:01 6 the reconstruction, Hounsfield Units and being able to store
15:17:05 7 the volume of the model. The next item is volume stitching.
15:17:11 8 So this is especially important for the smaller volume
15:17:15 9 scanners where it can only get maybe two teeth, maybe one
15:17:19 10 tooth, maybe three teeth. So if you need to put a bigger
15:17:23 11 area, you you need to do proximity scans so if you need to
15:17:27 12 do that, you need to the scans to stitch them together.
15:17:31 13 Another stitching benefit that is there is what if you need
15:17:35 14 the whole head. Usually it cuts off by the temple, what if
15:17:40 15 you need the whole head, you need to be able to do two
15:17:44 16 scans. I do two scans, put them together, that's stitching.
15:17:48 17 The open patient positioning, so that some medical CT's you
15:17:52 18 lie down and it takes you through the doughnut. Well this
15:17:56 19 one, you stand up, you put your head in the chin rest and
15:18:00 20 the system kind of like goes through space as you're
15:18:04 21 standing there, it's an open patient positioning concept.

15:18:11 22 The S-C-A-R-A technology, that is an acronym
15:18:15 23 used by Planmeca for the motion, how the motors and the
15:18:19 24 ability to move things are done. To me it's just the motion
15:18:23 25 controlling of the device.

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15:18:27 1 Ultra low dose protocol. So this is when you
15:18:36 2 have a patient like a child, a much smaller head, there is
15:18:41 3 no reason whatsoever to put the same dose as an adult gets
15:18:46 4 on to a child. I mean the reasons are even worse because
15:18:50 5 they're growing up and the radiation will have more effect
15:18:54 6 on them. You make it much harder if you're even putting an
15:19:00 7 adult dose on them.

15:19:01 8 Another reason for having ultra low dose
15:19:04 9 protocol is well maybe you're just doing a follow-up, you
15:19:08 10 really don't need to analyze, maybe it's a noise, it's just
15:19:13 11 fine and you do the radiation. And the endodontic mode is
15:19:20 12 to analyze the dental structure. SmartPan is something I'm
15:19:24 13 very familiar with, I actually had a similar thing myself,
15:19:28 14 is to be able to do a panoramic without having to do a CT
15:19:33 15 scan, so doing that old style panoramic the one where the
15:19:38 16 doctor had all of the focus on the problem, but to be able
15:19:43 17 to do it on the digital sensor. And then A I N O noise
15:19:48 18 removal, that's just a method to improve the quality of the
15:19:53 19 data, you remove noise so your image is clear.

15:19:55 20 Q. Is this allocation that's represented in this table,
15:19:59 21 is this your original opinion?

15:20:03 22 A. No, this was not my original, I modified it a little
15:20:07 23 bit, and I represented it here.

15:20:09 24 Q. Can you walk us through, what was modified?

15:20:13 25 A. The SmartPan, and I think volume stitching was put

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15:20:18 1 together, but as I understood what's SmartPan was, I realize
15:20:25 2 that it is not a panoramic that would require the
15:20:29 3 tomographic modeling. So when you have a CT of the full
15:20:34 4 head, the ones we talked about, one thing the doctors love
15:20:38 5 to do is they make an image and they generate a panoramic
15:20:44 6 image, they generate an image that looks like a lot like
15:20:47 7 panoramic image. It is not, it doesn't have the
15:20:51 8 magnification and the blurring, it's a slice through 3D
15:20:54 9 space. So it was my understanding that SmartPan is that.
15:20:58 10 So if it is that, then the values that are depicted are
15:21:03 11 Hounsfield Units, they are densities, they are based on
15:21:06 12 model. But what I understand now is that the SmartPan uses
15:21:09 13 the detector, a small part of the detector that goes along,
15:21:14 14 it generates a panoramic as it moves along. I did the same
15:21:18 15 thing and I can make multiple focal layers because I take a
15:21:23 16 snapshot and I can sometime plate that panoramic view, that
15:21:28 17 was my understanding of the modifying.

15:21:30 18 Q. Thank you. So if I understand you correctly, the
15:21:33 19 SmartPan you originally included as something that was
15:21:37 20 covered by the asserted claims but then you took it out; is
15:21:41 21 that right?

15:21:41 22 A. That's right, yes.

15:21:42 23 Q. If it were in there, it would have been -- the total
15:21:45 24 would have been 85 percent?

15:21:46 25 A. Yes, sir.

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15:21:47 1 Q. But having taken it out, you now apportion
15:21:52 2 75 percent?

15:21:52 3 A. That's correct.

15:21:52 4 Q. What does it mean that you're apportioning 75 percent
15:21:56 5 at a high level of the features from the Planmeca ProMax 3D
15:22:01 6 systems to the the asserted claims, the claims that we've
15:22:04 7 concluded are being infringed?

15:22:07 8 A. On a high level it means that the elements of that I
15:22:12 9 apportion to are enjoying that benefit because you have a
15:22:15 10 tomographic model of a density. The goal of the invention.

15:22:23 11 Q. Let's move on to the final topic, you may have
15:22:27 12 mentioned earlier which is license agreements. What
15:22:33 13 analysis did you do with respect to license agreements?

15:22:36 14 A. Yes, sir. So I was provided a set of license
15:22:43 15 agreements. And these are licenses between parties that are
15:22:54 16 around some technology area and it was my duty to analyze
15:23:00 17 that technology to see if it is relevant to the invention,
15:23:05 18 to see if the technology is hard enough, does it affect a
15:23:13 19 lot of systems, how does that technology value with respect
15:23:18 20 to the patent. And that's the analysis I did trying to
15:23:23 21 figure out how comparable it is.

15:23:24 22 Q. And why did you do that analysis?

15:23:27 23 A. Well, that's because the damages expert again, he can
15:23:32 24 analyze economics, but he does not understand the technical
15:23:38 25 aspect of it. So I brought in the technical portions, and

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15:23:43 1 as I will explain as we go through each one of the
15:23:46 2 agreements.

15:23:46 3 Q. All right. So the first agreement here is an
15:23:50 4 agreement, it appears to be between Planmeca and a company
15:23:55 5 called Lemchen, is that correct?

15:23:57 6 A. Lemchen.

15:23:58 7 Q. What was that agreement for?

15:24:00 8 A. That was for correlating superficial surface
15:24:03 9 information with x-ray information. So some of the pictures
15:24:05 10 that we saw that there was a photo face on top of a bone
15:24:12 11 structure, that was the superficial, we matched something
15:24:16 12 with the scan. So in my opinion this type of technology was
15:24:21 13 significantly narrower scope than the asserted patent. We
15:24:27 14 already had a tomographic model, you just added something to
15:24:31 15 it. I even analyzed a system that could do exactly that,
15:24:34 16 and the process of adding a camera to put the color of the
15:24:41 17 skin on top of a, you know, tomographic model data was one,
15:24:47 18 easier, but not everybody really wanted it, but it's a much
15:24:53 19 narrower scope than the tomographic model using
15:24:57 20 densitometry.

15:24:59 21 Q. Why is it a more narrow scope?

15:25:03 22 A. Well, as I just explained, it's -- you already need a
15:25:09 23 tomographic model to be able to merge it with this. This is
15:25:17 24 kind of like registering the photo with some 3D data set.

15:25:22 25 Q. Okay. All right. What's the second agreement

15:25:29 1 between Planmeca and Xoran?

15:25:33 2 A. Xoran, yes.

15:25:34 3 Q. What was that about?

15:25:37 4 A. Xoran had an upright scanner and the idea there is
15:25:42 5 that they're scanning while the patient is standing, so
15:25:46 6 basically as the spine is compressed, okay? And the other
15:25:50 7 thing, even for like a knee, as you're standing you get a
15:25:56 8 different image than if you're lying down. The Xoran
15:26:00 9 upright scanner and the its improvements in scanners that
15:26:04 10 included a camera, Xoran had a camera to capture external
15:26:09 11 images in combination with 3D CT images. Again, we're
15:26:15 12 talking about an upright scanner, we're talking about
15:26:17 13 something else, not a dental tomographic modeling of dental
15:26:23 14 structures.

15:26:23 15 Q. And in forming your opinion about this, did you
15:26:26 16 review both the Lemchen and Xoran agreements?

15:26:30 17 A. Yes, sir, I did.

15:26:31 18 Q. The ones with Planmeca?

15:26:32 19 A. Yes, sir, I did.

15:26:32 20 Q. We've got four other agreements listed here. Do you
15:26:40 21 know whether these, the agreements listed here are with
15:26:42 22 Planmeca in particular?

15:26:42 23 A. No, these are not with Planmeca, these were open
15:26:51 24 available to the public agreements.

15:26:54 25 Q. What does that mean?

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15:26:55 1 A. Well, anyone can find these agreements.

15:27:02 2 Q. The first one here is an agreement for a computed
15:27:06 3 tomography laser. Do you see that?

15:27:09 4 A. I see.

15:27:10 5 Q. What was that agreement for?

15:27:11 6 A. This particular product I looked at it in great
15:27:16 7 detail. What this is is that instead of an x-ray, you use
15:27:22 8 an infrared laser. So for tomography, there is a bed, you
15:27:30 9 lie on it, the breast goes into the opening and the laser
15:27:31 10 scans it, much like the x-ray. Except that it's infrared
15:27:38 11 laser. And the idea behind that, which personally I think
15:27:41 12 is genius, it's kind of like red and it interacts with the
15:27:48 13 red blood cell. So tumors what they like is blood, so
15:27:52 14 something that consumes blood, theoretically, would show up
15:27:56 15 as a laser interacting with that blood. And my
15:28:00 16 understanding when I talked to people that used it and
15:28:04 17 invented it, at RSNA meeting is that the images are
15:28:11 18 horrendous, they're very ugly, it doesn't make any sense,
15:28:15 19 but if there is a tumor, it shows like a sore thumb. It
15:28:18 20 shows it very easily, early detection, it's very nice.

15:28:22 21 The problem here is that -- in my opinion, the
15:28:27 22 technology, the hardship of the technology is similar. The
15:28:32 23 problem here is that computer tomography is a very small
15:28:41 24 market. Everybody has teeth, okay, and for tomography, the
15:28:47 25 standard is you get a tomograph, on special cases you will

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15:28:51 1 be sent to get a computer tomography like this with laser.
15:28:57 2 Ordinary of magnitude of market difference, that's why I
15:29:00 3 said the market for this is much, much smaller.

15:29:03 4 Q. All right. The second agreement here is for a color
15:29:06 5 MRI. What was that agreement about?

15:29:10 6 A. This one is pretty simple, using MRI images again,
15:29:14 7 3D, this agreement was to color rise, color rise, color rise
15:29:19 8 things. Color rising bone density. Okay. The MRIs, again,
15:29:27 9 is a much narrower set of equipment than CT's. So my
15:29:31 10 opinion was that it's more narrowly focused on density
15:29:34 11 coloring used for orthopedic purposes with expensive MRI
15:29:41 12 machines. One, they're only using it for coloring, two,
15:29:44 13 it's only on MRI machines, so the two of them would not be
15:29:51 14 comparable to dental machines.

15:29:54 15 Q. We're halfway home. What about the third one here,
15:29:59 16 x-ray tomography, what was that agreement for?

15:30:03 17 A. The x-ray tomography agreement just related to
15:30:06 18 examining an object through the use of penetrating radiation
15:30:09 19 such as x-rays or gamma rays and based on principle of
15:30:14 20 tomographic reconstruction. So the gamma rays, is just
15:30:21 21 penetrating radiation as well, used for other purposes,
15:30:24 22 x-rays are what we have been talking about here. But the
15:30:29 23 opinions that I formed is that the teachings of the asserted
15:30:34 24 patents are an improvement over teachings of the HFC
15:30:39 25 patents, so these are the basic. This agreement is the

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15:30:42 1 basic. Dr. Massie took that and applied that to a much
15:30:47 2 different level. Okay? So it is, the asserted patents are
15:30:58 3 much more technological available.

15:31:00 4 Q. And finally there was an agreement with FluroScan,
15:31:03 5 what was that agreement for?

15:31:04 6 A. This relates to amplifying x-rays that have been
15:31:08 7 converted to visible light and to an electrical power supply
15:31:11 8 for high voltage signals for diagnostic applications, such
15:31:16 9 as x-ray devices. If that is a mouth full, what that is
15:31:19 10 really is that once the x-rays are detected to visible
15:31:28 11 light, the image amplifier that I mentioned an hour or so
15:31:31 12 ago, those can be converted to electrons and using ionized
15:31:37 13 plates it can be accelerated, and when it hits another
15:31:44 14 phosphate, it becomes brighter, that's why they call it an
15:31:47 15 amplifier. That in my opinion is just a portion of the
15:31:50 16 detection, and I write my opinion the teachings includes in
15:31:55 17 the NASA patents are a small subset of those represented
15:31:59 18 enter the asserted patents, and therefore the asserted
15:32:01 19 patents are more technologically valuable.

15:32:04 20 Q. Why did you reach that conclusion?

15:32:06 21 A. Well, because it's smaller subset, it's just detects
15:32:11 22 part, it's not even detection part, it's accelerating, it's
15:32:16 23 a portion of the detection part.

15:32:21 24 Q. Dr. Kia, in your opinion, in the 2007 time frame,
15:32:28 25 would it have been a viable non-infringing alternative to

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15:32:33 1 Dr. Massie's patents available?

15:32:35 2 A. Not really, not to my knowledge.

15:32:36 3 Q. Why not?

15:32:37 4 A. Because I was in the field and knew exactly what to
15:32:43 5 do. If there was a better way of doing it, I would have
15:32:49 6 found it.

15:32:51 7 Q. What if they just removed the Hounsfield Unit values
15:32:56 8 that we showed being displayed, would that be enough?

15:33:02 9 A. No. The CT numbers that would drive the Hounsfield
15:33:10 10 Units, that is actually variable, a lot of factors. If a
15:33:16 11 new unit, I don't know all the Planmeca unit, a new unit, I
15:33:21 12 don't know, if that came out, that would be a linear
15:33:25 13 combination of the Hounsfield Unit, it would track density
15:33:29 14 just as well. And really the beauty of Hounsfield Unit is
15:33:33 15 it's calibrated from machine to machine to machine, every
15:33:37 16 doctor can rely on it. There is no need to do guesswork.
15:33:41 17 The Sirona CT makes a dataset it can compare with Planmeca
15:33:47 18 CT, and the doctors have a chance to compare those CT
15:33:51 19 values, those Hounsfield Unit values together.

15:34:42 20 Q. Dr. Kia, I'm going to show you, were you here when
15:34:50 21 Planmeca gave its opening presentation?

15:34:52 22 A. Yes, sir, I was here.

15:34:53 23 Q. Do you remember they showed this slide?

15:34:54 24 A. Yes, sir, I do.

15:34:57 25 Q. Do you see how the position is that ProMax did not do

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15:35:01 1 densitometry, did not concrete claimed models and did not
15:35:05 2 compare the claimed models, do you see that?

15:35:06 3 A. Yes, I do.

15:35:07 4 Q. Do you agree with any of those statements?

15:35:09 5 A. No, I do not.

15:35:10 6 Q. I know we spent about six hours discussing this, but
15:35:13 7 can you again quickly say why these opinions statements in
15:35:18 8 your opinion are not correct?

15:35:19 9 A. As for the densitometry, the Hounsfield Units, they
15:35:21 10 provide dependence of doctors of how to place implants, how
15:35:21 11 to rely on from patient to patient to patient, that is
15:35:31 12 densitometry, that is densitometry. There is no way that
15:35:31 13 the ProMax 3D can operate and provide valuable data to the
15:35:41 14 doctors without it. That's one.

15:35:41 15 The FDA through testing was most potentially be
15:35:51 16 able to provide some opinion on that also. If the patient
15:36:01 17 comes in and the doctor rely that certain Hounsfield Units
15:36:04 18 will work with the implant and consistently all the patients
15:36:08 19 fail that implant, well there is something wrong. The FDA
15:36:15 20 would have to step in and not let that happen. I mean,
15:36:18 21 that's one of the reasons why I made sure in my system that
15:36:22 22 my data was -- it can be trust had from patient to patient
15:36:23 23 to patient to machine to machine. So by providing
15:36:31 24 Hounsfield Units and having to knots be densitometry, not be
15:36:32 25 presenting density value is just, I don't understand that,

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15:36:39 1 it can't happen.

15:36:41 2 Q. And, in fact, we saw a slide with screen shot showing
15:36:46 3 where Planmeca software refers to the HU, the Hounsfield
15:36:52 4 Units as density, right?

15:36:53 5 A. That's correct.

15:36:54 6 Q. All right. What about the second point here?

15:36:57 7 A. So, ProMax 3D did not create the claimed models.
15:37:05 8 They create the 3D volume, that 3D volume is the tomographic
15:37:12 9 model. It captures all of the bone and tooth data. It can
15:37:19 10 cut it from any angle, so that's the model. The only thing
15:37:25 11 I can think of is they're thinking of completely different
15:37:28 12 model. What model, I don't understand. But the
15:37:35 13 tomographical model that I understand that I even made is
15:37:39 14 that 3D model, is the CT scan. And that enabled the
15:37:48 15 resources for the doctors.

15:37:52 16 Q. The third one?

15:37:54 17 A. And compare the claimed models, again, we saw the
15:37:58 18 comparison. So when I see that comparison and I am trying
15:38:09 19 to analyze the dental model of the jaw of the maxilla as I
15:38:12 20 described earlier, it is important to be able to compare it
15:38:22 21 so I just can't believe that there is no comparison. The
15:38:25 22 only thing remotely in my mind is that they're thinking of a
15:38:32 23 different model. I don't know what model that would be. To
15:38:36 24 me that would be the model captured in the CT.

15:38:37 25 MR. OSTROW: Dr. Kia. Thank you very much for

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15:38:40 1 the lengthy presentation. I have no further questions at
15:38:43 2 this time, Your Honor.

15:38:44 3 THE COURT: All right. So we took a little
15:38:47 4 longer than we should have the last break, so I'm going to
15:38:51 5 tell you five minutes, but I want you back here in at least
15:38:55 6 ten. Okay.

15:39:02 7 COURT CLERK: All rise.

15:39:04 8 (Jury leaving the courtroom at 3:39 p.m.)

15:39:16 9 (A brief recess was taken.)

15:47:31 10 COURT CLERK: All rise.

15:47:33 11 (Jury entering the courtroom at 3:47 p.m.)

15:47:43 12 THE COURT: You may be seated, ladies and
15:47:54 13 gentlemen. Dr. Kia, if you would return to the witness
15:47:57 14 stand, we'll start cross-examination.

15:48:01 15 CROSS-EXAMINATION.

15:48:17 16 THE COURT: You may proceed, counsel.

15:48:18 17 MR. QURESHI: Thank you.

15:48:19 18 BY MR. QURESHI:

15:48:20 19 Q. Dr. Kia, can you hear me okay?

15:48:22 20 A. Yes, sir, I can.

15:48:23 21 Q. Dr. Kia, you were here for Dr. Massie's testimony
15:48:24 22 today and yesterday, right?

15:48:25 23 A. Yes, sir, I was.

15:48:26 24 Q. Okay. Is there anything you disagreed with from his
15:48:27 25 testimony?

15:48:38 1 A. I don't know how to interpret that question.

15:48:41 2 Q. You heard him testify about his patents. Do you have
15:48:44 3 any disagreement with him about what he said about his
15:48:47 4 patents?

15:48:50 5 A. I take his input as his opinion, and I remain
15:48:58 6 confident in my opinion.

15:48:59 7 Q. What I'm asking you is did you -- do you disagree
15:49:04 8 with any of his testimony about his patents?

15:49:08 9 A. I really don't think if I could -- if I formed any
15:49:12 10 agreement or disagreement with anything in particular.

15:49:15 11 Q. Okay. Now, you prepared three expert reports in this
15:49:20 12 case; right?

15:49:21 13 A. That's correct, yes, sir.

15:49:22 14 Q. Your first expert report was on infringement and that
15:49:25 15 was dated May 30th, 2019?

15:49:28 16 A. Visual eggs is taxing me.

15:49:31 17 Q. Around May 2019?

15:49:35 18 A. Sounds good.

15:49:37 19 Q. We'll probably refer to it with the date.

15:49:40 20 And then a few months later, you submitted two
15:49:42 21 other expert reports, one was in response to Dr. Pelc's
15:49:44 22 report that the patents are invalid, and then another report
15:49:47 23 where you were responding to Dr. Pelc's report on why he
15:49:50 24 thinks the patents are not infringed, correct?

15:49:52 25 A. That's correct, yes.

15:49:59 1 Q. Now, you understand that in your expert reports in
15:50:02 2 this case, you were to disclose everything you were going to
15:50:07 3 rely on at trial, correct?

15:50:08 4 A. That's correct.

15:50:09 5 Q. And if there was an error or something that was
15:50:12 6 inaccurate or incomplete, you could have attempted to
15:50:15 7 supplement one or more of your expert reports, correct?

15:50:18 8 A. As best as I could, yes.

15:50:20 9 Q. You didn't serve any supplemental expert reports;
15:50:23 10 correct?

15:50:24 11 A. I don't remember, no, I don't think so.

15:50:29 12 Q. Now, you agree with me that a person with experience
15:50:34 13 in medical imaging does not have the requisite ability to
15:50:41 14 produce their own imaging system with the combined existing
15:50:45 15 systems to make a new system; right?

15:50:48 16 A. I lost you halfway in between, that was quite a long
15:50:54 17 question. I couldn't follow you, I'm sorry.

15:50:57 18 Q. Okay. Do you agree with me that a person with
15:51:01 19 experience in medical imaging does not have the requisite
15:51:06 20 ability to produce their own imaging system or to combine
15:51:12 21 existing systems to make a new system?

15:51:18 22 A. I don't know how to answer that, I guess it would
15:51:23 23 depend on the situation, it depends on what system and what
15:51:29 24 are the key elements to making it.

15:51:32 25 Q. Let's me ask you another question. Do you agree with

15:51:32 1 me, Dr. Kia, that gaining operational experience with a
15:51:37 2 medical imaging device does not build the necessary
15:51:41 3 knowledge that goes to build such a system?

15:51:50 4 A. Okay. So I think I am starting to understand your
15:51:55 5 question, and I am not sure I have it correct. So if I may
15:52:01 6 rephrase it back to you, is that what you want?

15:52:04 7 Q. Sure. Someone who uses x-rays, or can read x-rays,
15:52:12 8 it doesn't mean that they can build a diagnostic imaging
15:52:18 9 system or x-ray system. Do you agree with that?

15:52:21 10 A. Generally, yes. And the way I see it as you are
15:52:25 11 defining the limitations of that question is that a
15:52:28 12 technician that operates an x-ray, bring the patient here,
15:52:34 13 make sure the field of view, kind of like a chest x-ray
15:52:38 14 we've all had, come here, stay there, click, take the
15:52:42 15 cassette, go load it, someone like that that's operating it,
15:52:47 16 would not know how to make it.

15:52:49 17 Q. For example, a dentist?

15:52:51 18 A. It depends which dentist. There were dentists that
15:52:56 19 had purchased our machines that they went on and
15:53:00 20 reengineered and made new products themselves, they could do
15:53:03 21 it.

15:53:03 22 Q. A couple of sentences I asked you if you agreed with
15:53:06 23 me or not, you're not familiar with making those statements?

15:53:09 24 A. I'm sorry?

15:53:10 25 Q. You're not familiar with making the statements that I

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15:53:13 1 asked you if you agreed with or not?

15:53:15 2 A. I mean, if that's something I said in my report or my
15:53:18 3 deposition, please point me to it, I'll see if I recall
15:53:23 4 under what circumstances I answered them, I would be more
15:53:26 5 than happy to answer.

15:53:44 6 MR. QURESHI: Your Honor, may I hand these up?

15:53:46 7 THE COURT: Yes, you may.

15:53:57 8 BY MR. QURESHI:

15:53:57 9 Q. I have handed you a document. Do you recognize this
15:54:04 10 document, Dr. Kia?

15:54:05 11 A. No, I do not.

15:54:06 12 Q. If you look on the last page, it has your signature,
15:54:09 13 correct?

15:54:10 14 A. Yes, sir.

15:54:11 15 Q. It's a document dated February 20, 2019, a few months
15:54:14 16 before the expert report that you did in this case, correct?

15:54:15 17 A. I don't know the exact timing, but it seems like it
15:54:21 18 is a document that I authored.

15:54:22 19 Q. You don't know the exact timing yet your signature is
15:54:29 20 right by the date?

15:54:30 21 A. I said, the filing, I don't recall the exact date.
15:54:32 22 Yeah, I do see that there is a date by my signature, but you
15:54:39 23 mentioned with respect to something else.

15:54:40 24 Q. I understand. And this is a declaration you
15:54:44 25 mentioned, it's an IPR, I think we both understand that the

15:54:48 1 IPR is a proceeding at the Patent Office, is that correct?

15:54:51 2 A. That's correct.

15:54:52 3 Q. If you turn to page 8. I'm sort of in the middle of
15:55:03 4 the page. There is a sentence that begins "a person with".
15:55:08 5 Do you see that?

15:55:09 6 A. Yes.

15:55:09 7 Q. I'll read this and you tell me if I read it
15:55:12 8 correctly, this is a declaration that you signed. "A person
15:55:14 9 with experience in medical imaging does not have the
15:55:17 10 requisite ability to produce their own imaging system or to
15:55:21 11 combine existing systems to make a new system. Gaining
15:55:24 12 operational experience with a medical imaging device does
15:55:27 13 not build the necessary knowledge that goes to build such a
15:55:31 14 system. A person with experience only utilizing medical
15:55:34 15 imaging technology does not necessarily know how to make
15:55:37 16 that same system." Did I read that correctly, Dr. Kia?

15:55:41 7 A. Yes, you did.

15:55:44 8 Q. I'm done with that document.

15:55:47 9 Dr. Kia, as of 1999, you had not designed,
15:55:50 10 developed, or built a diagnostic imaging system; correct?

15:56:03 11 A. Exactly what was the date again?

15:56:06 12 Q. 1999.

15:56:10 13 A. I have to look at my resume, but I think I did.

15:56:24 14 Q. Please do. PX-911.

15:56:52 15 A. (Witness reviewing document.)

15:57:17 1 A. So in terms of the diagnostic imaging system, can I
15:57:24 2 clarify, what is it exactly that you are asking?

15:57:28 3 Q. My question was as of 1999, you had not designed,
15:57:32 4 developed, or built a diagnostic imaging system; correct?

15:57:37 5 A. So not quite. Not quite correct. But for
15:57:42 6 clarification, I wanted to understand what it is that you
15:57:44 7 mean by diagnostic imaging system.

15:57:47 8 Q. It's an imaging system to take pictures inside your
15:57:50 9 body to make diagnoses.

15:57:57 10 A. Yes, that would be correct.

15:57:59 11 Q. Okay. And you have stated in the past that you have
15:58:02 12 worked with x-ray imaging for medical diagnostic since 1999;
15:58:08 13 correct?

15:58:08 14 A. That's correct, yes.

15:58:10 15 Q. Now, as of 1999, you did not have work experience in
15:58:16 16 densitometry and/or tomographic imaging, correct?

15:58:31 17 A. I'm sorry, did you mention work experience?

15:58:35 18 Q. Yes, sir?

15:58:35 19 A. Yes, I had.

15:58:39 20 Q. And as of 1999, you had not authored or co-authored
15:58:42 21 any publication or other paper on diagnostic imaging
15:58:46 22 systems, correct?

15:58:47 23 A. That's correct.

15:58:49 24 Q. And as of 1999 you had no patents or patent
15:58:52 25 applications on diagnostic imaging systems, correct?

15:58:57 1 A. That's correct.

15:58:58 2 Q. And as of 1999, you had not authored or coauthored

15:59:02 3 any publication or other paper on x-ray technology, correct?

15:59:08 4 A. Before 1999?

15:59:12 5 Q. As of 1999, yes.

15:59:13 6 A. I don't understand what you mean by as of 1999.

15:59:16 7 Q. In 1999 or before?

15:59:17 8 A. Or before. Yes, that's correct.

15:59:20 9 Q. You had not published anything about tomography as of

15:59:27 10 1999?

15:59:28 11 A. That's correct.

15:59:28 12 Q. You had not published anything about commuted

15:59:31 13 tomography as of 1999, is that correct?

15:59:33 14 A. That's correct.

15:59:33 15 Q. You had not published anything about cone beam

15:59:34 16 computed tomography as of 1999, correct?

15:59:38 17 A. Correct.

15:59:38 18 Q. You had not published anything about Hounsfield Units

15:59:43 19 as of 1999?

15:59:45 20 A. That's correct.

15:59:46 21 Q. And you have no patent or patent applications as of

15:59:48 22 1999 on x-ray technologies like tomography, computed

15:59:50 23 tomography, or cone beam computed tomography, correct?

15:59:52 24 A. Again, I lost you.

15:59:52 25 Q. As of 1999, you did not have any patent or patent

16:00:03 1 applications on x-ray technologies like tomography, computed
16:00:09 2 tomography, or cone beam computed tomography, correct?

16:00:12 3 A. That's correct.

16:00:13 4 Q. As of 1999, you had not authored or co-authored any
16:00:18 5 publication or other paper on densitometry, correct?

16:00:21 6 A. That's correct.

16:00:21 7 Q. You had not authored or co-authored any publication
16:00:26 8 about bone density as of 1999; correct?

16:00:28 9 A. That's correct.

16:00:29 10 Q. Nor on the topic of bone marrow density, correct?

16:00:34 11 A. That's correct.

16:00:35 12 Q. As of 1999, your CV does not list any radiology
16:00:41 13 industry groups that you were a member of, correct?

16:00:43 14 A. That's correct.

16:00:44 15 Q. And your CV does not list any scientific or
16:00:47 16 professional organizations that you were a member of as of
16:00:51 17 1999 on the topic of radiology or diagnostic imaging
16:00:54 18 systems, correct?

16:00:54 19 A. That's correct.

16:00:57 20 Q. And your CV does not list any awards from a
16:01:02 21 professional organization for your work in diagnostic
16:01:04 22 imaging, correct?

16:01:05 23 A. That's correct.

16:01:06 24 Q. And your CV does not show that you served as a
16:01:09 25 reviewer for any journal or publication devoted to

16:01:14 1 diagnostic imaging correct?

16:01:19 2 A. That's correct.

16:01:19 3 Q. Now, if you can look at your opening report, and
16:01:20 4 that's tab -- it's Tab 8 of the binder I gave you.

16:01:38 5 A. I'm sorry, tab A, you said.

16:01:40 6 Q. Eight, the number eight.

16:01:46 7 THE COURT: I don't think you gave him a binder.

16:01:49 8 MR. QURESHI: Let me hand it up. Your Honor,
16:01:52 9 may I approach?

16:01:53 10 THE COURT: Yes.

16:01:53 11 MR. QURESHI: Sorry about that.

16:02:18 12 Q. Do you have Tab 8?

16:02:19 13 A. Yes.

16:02:20 14 Q. Does that look like your opening report that you
16:02:23 15 served in this case?

16:02:23 16 A. Yes, it does.

16:02:25 17 Q. Just so we're on the same page because we weren't
16:02:28 18 sure about the date, that's May 30th of 2019 if we can look
16:02:31 19 at -- you list a number of imaging patents and a patents
16:02:41 20 application that you are listed as an inventor on, is that
16:02:42 21 correct?

16:02:42 22 A. That's correct.

16:02:42 23 Q. And none of those patents or that patent application
16:02:44 24 was filed in or before 1999; correct?

16:02:50 25 A. That would be correct, yes.

16:03:01 1 Q. Now, you mentioned that you worked at a company
16:03:04 2 called Imaging Science?
16:03:06 3 A. Yes, sir.
16:03:06 4 Q. And I believe we saw a slide about that in opening
16:03:10 5 statement and also during your presentation; correct?
16:03:12 6 A. It's actually Imaging Sciences International.
16:03:18 7 Q. Imaging Sciences International? Can you call it
16:03:23 8 Imaging Science?
16:03:25 9 Q. Imaging Sciences?
16:03:26 10 A. International.
16:03:27 11 Q. What years were you at Imaging Sciences
16:03:31 12 International?
16:03:31 13 A. Starting at 2004 and maybe sometime in 2009.
16:03:37 14 Q. Was your title chief scientist throughout your time
16:03:40 15 there?
16:03:40 16 A. Yes, sir, it was.
16:03:42 17 Q. And during your time at Imaging Sciences
16:03:46 18 International, you were involved in the development of a
16:03:48 19 product called the "ICAT", correct?
16:03:51 20 A. Right.
16:03:52 21 Q. What years were you involved in or working on the
16:03:56 22 "ICAT" product that Imaging Sciences International had?
16:04:00 23 A. I was involved with ICAT when I started.
16:04:04 24 Q. And your role as chief scientist you worked on that
16:04:07 25 product?

16:04:08 1 A. Yes, sir.

16:04:08 2 Q. And ICAT was a 3D CBCT dental imaging machine, right?

16:04:15 3 A. That's correct.

16:04:16 4 Q. It used pixel values, right?

16:04:21 5 A. I'm sorry, I don't understand your question.

16:04:23 6 Q. That machine used pixel values, right?

16:04:26 7 A. Well, I don't understand what you mean by pixel

16:04:29 8 values.

16:04:29 9 Q. You gave a presentation in your direct testimony

16:04:32 10 where you showed a slide of pixels and voxels, and in your

16:04:37 11 expert report you say that pixels and voxels have values,

16:04:40 12 numbers, right?

16:04:41 13 A. Yes, sir, that's what I said.

16:04:42 14 Q. Any question is, did the ICAT use pixel value?

16:04:46 15 A. So again, I don't understand your question. What you

16:04:50 16 referred to before was a context of how electrons are

16:04:55 17 gathered, how data is generated, pixels are formed, it was

16:05:00 18 in context. Where your question does not have any context,

16:05:03 19 you're just saying pixels, I don't know what you mean with

16:05:07 20 just that pixels are from.

16:05:09 21 Q. Did the ICAT device, the imaging system that you

16:05:12 22 worked on, did that use, in any way, pixel values?

16:05:22 23 A. Yeah, a large number of devices use pixel values.

16:05:26 24 Q. Did it use voxel values?

16:05:32 25 A. Again same problem as before, I don't know what you

16:05:33 1 mean by voxel values, what context?

16:05:36 2 Q. In the context of the product that you were working

16:05:39 3 on at Imaging Sciences International, ICAT?

16:05:43 4 A. So voxels, as is used in that system has a few

16:05:49 5 understandings. I think what you're trying to say is that

16:05:53 6 the result of the reconstruction that generates the

16:06:03 7 photographic model that I was talking about, the voxels in

16:06:06 8 that volume, is that correct?

16:06:08 9 Q. In that context, did ICAT use it in that way?

16:06:12 10 A. So the voxels had digital value, yes.

16:06:15 11 Q. Thank you. Can the ICAT use Hounsfield Units to

16:06:19 12 calibrate what you called representative -- to represent

16:06:25 13 density?

16:06:25 14 A. Yes, it did.

16:06:27 15 Q. And why did ICAT use Hounsfield Units?

16:06:32 16 A. Because it was a standard way to provide that output

16:06:34 17 to dentists to be able to use it appropriately.

16:06:42 18 Q. Did the I CAT do densitometry?

16:06:45 19 A. For the purpose of using Hounsfield Units units for

16:06:51 20 density, yes.

16:06:52 21 Q. Now, had your firsthand knowledge of how the ICAT

16:06:52 22 system worked influenced your opinion as to how Planmeca's

16:07:02 23 ProMax 3D products work?

16:07:04 24 A. I don't know how to answer that question. My

16:07:05 25 knowledge of how the ICAT system works or even the analysis

16:07:15 1 I did on competing products of how they worked, it gives me
16:07:19 2 an understanding of how these type of machines work. And as
16:07:24 3 far as that is concerned, that helped me analyze what
16:07:29 4 Planmeca's machine did. I can't really say that it
16:07:33 5 influenced me, it -- I have gathered the knowledge of how
16:07:38 6 these machines work and I know the variety of ways that they
16:07:41 7 work and I applied it to my understanding of how Planmeca's
16:07:44 8 works.

16:07:46 9 Q. Okay. So you're obviously very familiar with how
16:07:50 10 ICAT worked since you helped design it, you worked on it.
16:07:54 11 When you were analyzing the Planmeca ProMax 3D products, did
16:07:58 12 you refer to your firsthand knowledge of how I CAT worked or
16:08:02 13 works to make an opinion as to how the ProMax Planmeca
16:08:06 14 product worked?

16:08:10 15 A. So in looking at the evidence that was presented, I
16:08:14 16 understood it for what the evidence showed, primarily that,
16:08:18 17 without regards to what any other machine did, at any point
16:08:22 18 that there is alternative ways of doing things, I reached
16:08:26 19 out to what my understanding would be. And if it requires
16:08:30 20 any other way of doing things. So certainly my experience
16:08:34 21 helped with my analysis. But it's not like it formulated
16:08:38 22 it. It didn't push it one way, it helped me understand what
16:08:42 23 is it that Planmeca is doing.

16:09:00 24 Q. Okay. Now, in your direct examination, you
16:09:04 25 understand that you are required to testify and show all of

16:09:10 1 your evidence as to why you believe Planmeca infringed;
16:09:14 2 correct?

16:09:15 3 A. I don't quite understand what you're asking.

16:09:18 4 Q. In your direct examination with Mr. Ostrow, you as
16:09:24 5 Osseo's expert on the issue of infringement, were required
16:09:26 6 to disclose all the evidence that you have supporting your
16:09:30 7 opinion as to why you believe Planmeca infringes, correct?

16:09:34 8 A. Well my understanding is I provided the information
16:09:39 9 that would show -- I provided the evidence that would show
16:09:44 10 that it is infringing.

16:09:46 11 Q. Okay. Now, you did not show the jury any Planmeca
16:09:50 12 document, video, computer code, or other Planmeca material
16:09:51 13 about its product that uses the word densitometry; correct?

16:10:01 14 A. I have shown how Planmeca uses density.

16:10:08 15 Q. That wasn't my question, Dr. Kia. My question is,
16:10:11 16 did you show anything to the jury where a Planmeca document
16:10:16 17 about its ProMax 3D product used the word densitometry?

16:10:20 18 A. So, not exactly those words, but I can explain.

16:10:24 19 Q. I understand you have an opinion as to why Planmeca
16:10:28 20 does densitometry, but that's not my question. My question
16:10:32 21 is have you shown anything to the jury with the word
16:10:35 22 densitometry from Planmeca?

16:10:38 23 A. The same answer is, those words are not there, but I
16:10:42 24 can explain.

16:10:45 25 Q. Now, in your direct examination, you did not show the

16:10:43 1 jury any Planmeca document, video, computer code, or other
16:10:48 2 Planmeca material that said ProMax 3D or Romexis calculates
16:10:53 3 bone density or it can provide calculated bone density;
16:10:56 4 correct?

16:10:57 5 A. So, again, the words bone density I did not show, but
16:11:03 6 I can explain if you want to hear it.

16:11:06 7 Q. I'm sure Mr. Ostrow will come up and ask you to
16:11:10 8 explain.

16:11:10 9 Now, you did not have any role in designing or
16:11:15 10 manufacturing the accused Planmeca ProMax and Romexis
16:11:19 11 systems; correct?

16:11:20 12 A. That's correct.

16:11:20 13 Q. Planmeca designed them, correct?

16:11:23 14 A. Planmeca designed it how Planmeca designed it, I have
16:11:28 15 no insight of what techniques they used, if they partnered
16:11:34 16 with anyone, it's up to Planmeca.

16:11:37 17 Q. Okay. For example, you have read Mr. Muller's
16:11:39 18 testimony, right?

16:11:41 19 A. I recall reviewing it, yes.

16:11:43 20 Q. And he helped design the ProMax 3D systems that we're
16:11:50 21 talking about here today, correct?

16:11:51 22 A. I don't have anything to argue that, against that.

16:11:52 23 Q. Now, you did not have any role in developing any
16:11:56 24 aspect of the reconstruction server that works with
16:12:00 25 Planmeca's ProMax 3D systems?

Kia - cross

16:12:05 1 A. Yes, I did not.

16:12:06 2 Q. And you did not have any role in developing
16:12:09 3 Planmeca's Romexis software, correct?

16:12:12 4 A. That's correct, I did not.

16:12:15 5 Q. Okay. Now, since you were retained by Osseo, and
16:12:21 6 when were you retained by Osseo to be an expert for them in
16:12:25 7 this case?

16:12:26 8 A. I do not recall. A few years ago.

16:12:29 9 Q. And since you were retained a few years ago, you have
16:12:33 10 not physically tested a Planmeca ProMax 3D imaging system or
16:12:38 11 the Romexis software, correct?

16:12:40 12 A. That's correct, yes.

16:12:43 13 Q. You have never gone to Planmeca's offices in Finland
16:12:47 14 or the United States to use or inspect or watch a demo of
16:12:51 15 the accused products, correct?

16:12:51 16 A. That's correct.

16:12:52 17 Q. Even though I believe you spent time in Finland,
16:12:55 18 right?

16:12:56 19 A. The time in Finland was many, many years ago, not
16:13:00 20 before I started with Osseo. So even if I do have history
16:13:02 21 going to Finland, the aspect that I was in Finland doesn't
16:13:10 22 help out what we're doing.

16:13:12 23 Q. Well the Planmeca ProMax 3D system came out, do you
16:13:15 24 know when they came out, when they were launched?

16:13:20 25 A. Roughly, yes.

16:13:22 1

Q. When?

16:13:23 2

A. About 2007, I believe.

16:13:24 3

Q. Yes, that is definitely before Osseo retained you,

16:13:28 4

but credit that time since ProMax 3D was launched, you

16:13:31 5

haven't gone and seen any demos of the ProMax 3D or Romexis

16:13:35 6

system, correct?

16:13:36 7

A. That's correct, yes.

16:13:38 8

Q. You have not gone to a dentist office to go see or

16:13:42 9

use a Planmeca ProMax 3D imaging system or Romexis software,

16:13:47 10

correct?

16:13:47 11

A. That's correct.

16:13:47 12

Q. And there is nothing in your reports about speaking

16:13:50 13

with dentists who have used the ProMax 3D systems; correct?

16:13:55 14

A. That's correct.

16:13:55 15

Q. You have never asked a dentist why they bought a

16:13:58 16

ProMax 3D imaging system, correct?

16:14:02 17

A. Yes, I don't believe I would have any insight with

16:14:05 18

that discussion.

16:14:06 19

Q. And you never asked a dentist what features of a

16:14:09 20

Planmeca ProMax 3D imaging system they like or use; correct?

16:14:12 21

A. Yeah, correct, and I don't understand what I would

16:14:21 22

gain from it if I were to do it.

16:14:22 23

Q. You don't understand what you would gain from asking

16:14:25 24

a dentist what features of a ProMax 3D system they would

16:14:29 25

use?

Kia - cross

16:14:30 1 A. Yes.

16:14:30 2 Q. We'll come back to that.

16:14:31 3 Dr. Kia, I have looked at your CV, you're
16:14:34 4 obviously familiar with numerous software programing
16:14:38 5 languages, correct?

16:14:38 6 A. Yes, sir.

16:14:39 7 Q. You're very proficient with the CD and C plus plus
16:14:43 8 programing languages, right?

16:14:45 9 A. That's right.

16:14:45 10 Q. You're very proficient with the Java programing
16:14:49 11 language, correct?

16:14:50 12 A. Yes, sir.

16:14:51 13 Q. Now, do you know what software language Romexis is
16:14:55 14 written in?

16:14:57 15 A. I believe I mentioned that in my report.

16:15:00 16 Q. What language, do you remember without looking at the
16:15:03 17 report?

16:15:04 18 A. Probably not. In the back of my head, I think it's
16:15:08 19 Java, but I could be wrong.

16:15:11 20 Q. Now as part of this litigation, Planmeca made its
16:15:15 21 source code available for Osseo's attorneys and experts,
16:15:20 22 correct?

16:15:20 23 A. That's correct.

16:15:21 24 Q. And you physically -- let me explain or ask you how
16:15:25 25 this works so that the jury understands is that Osseo asked

16:15:33 1 to see Planmeca's source code for the accused products and
16:15:37 2 we made it available on a computer where an Osseo attorney
16:15:41 3 or expert could come look at it; right?

16:15:44 4 A. That's generally how it's done.

16:15:46 5 Q. And if there were source code that Osseo wanted to
16:15:51 6 use in the litigation, then portions of that source code
16:15:56 7 would be printed out, and we would produce it to you and
16:16:00 8 then you could refer to it?

16:16:03 9 A. That's correct.

16:16:03 10 Q. Now, when Planmeca, it was actually my law firm, made
16:16:08 11 that source code available, it wasn't you who came and
16:16:12 12 reviewed the source code at that computer, correct?

16:16:14 13 A. That's correct.

16:16:14 14 Q. I believe you mentioned that there was a gentleman
16:16:18 15 that did that and you talked to him about the source code
16:16:20 16 that we made available; correct?

16:16:21 17 A. That's correct, yes.

16:16:24 18 Q. And I believe in your presentation you said you
16:16:28 19 reviewed Planmeca's source code, correct?

16:16:31 20 A. That's correct, I did.

16:16:32 21 Q. But nowhere in your direct examination did you cite a
16:16:36 22 line of any source code, correct?

16:16:38 23 A. That's correct, I did not.

16:16:42 24 Q. Dr. Kia, are you aware of what the damages period is
16:16:46 25 in this case?

16:16:47 1 A. I am not a damages expert, I have a rough idea, not
16:16:52 2 an exact idea.

16:16:53 3 Q. With that qualification, what is your rough idea of
16:16:56 4 what the damages period is in this case?

16:16:58 5 A. I believe it's six years prior to the signing of the
16:17:01 6 complaint to the termination of the patent which I believe
16:17:03 7 the latest patent is '262 termination date.

16:17:07 8 Q. And so that is the period, when we say damages
16:17:11 9 period, but that is the period where you have to show
16:17:13 10 infringement; correct?

16:17:16 11 A. Yes.

16:17:20 12 Q. Now, you agree that if just one limitation of a
16:17:24 13 patent claim is not present in the accused system, then that
16:17:28 14 claim is not infringed; correct?

16:17:31 15 A. Generally that's correct. The law that all elements,
16:17:36 16 as I have been discussing all today, all have to be present
16:17:42 17 in the product.

16:17:43 18 Q. What do you mean by generally?

16:17:45 19 A. That's not me making it up, that's the law.

16:17:49 20 Q. I understand. So each and every word of a patent
16:17:54 21 claim has to be literally met by the accused Planmeca
16:17:59 22 systems in order for there to be infringement of that claim;
16:18:02 23 correct?

16:18:03 24 A. That's correct.

16:18:05 25 Q. And in doing an infringement analysis, you have to

Kia - cross

16:18:07 1 read a patent claim from the perspective of a person of
16:18:10 2 ordinary skill in the art at the time that patent was filed,
16:18:15 3 correct?

16:18:16 4 A. That's correct.

16:18:26 5 Q. Now, Dr. Kia, Dr. Massie did not invent a 2D imaging
16:18:35 6 system, correct?

16:18:37 7 A. You need to qualify what 2D imaging system, I mean
16:18:42 8 there is a lot of 2D imaging systems.

16:18:47 9 Q. 2D imaging systems are not covered by the asserted
16:18:50 10 claims that are at issue in this trial correct?

16:18:52 11 A. The same ambiguity there, are you talking about 2D
16:18:56 12 panoramic, 2D--

16:18:58 13 Q. Any 2D?

16:19:01 14 A. I'm assuming you mean dental 2D.

16:19:04 15 Q. Dental 2D.

16:19:06 16 A. I need to qualify that, 2D is a very open area.

16:19:10 17 Q. If you don't understand my question I will do my best
16:19:13 18 to clarify, I understand.

16:19:15 19 A. I asked before and you just repeated the question, I
16:19:17 20 just want to clarify what 2D system.

16:19:21 21 Q. The claims at issue in this trial do not cover 2D
16:19:23 22 dental images, correct?

16:19:25 23 A. That's correct.

16:19:27 24 Q. Hounsfield Units were known and used before 1999,
16:19:30 25 correct?

16:19:30 1 A. That's correct.

16:19:31 2 Q. Dr. Massie did not meant Hounsfield Units, correct?

16:19:38 3 A. He did not invent Hounsfield Units --

16:19:40 4 Q. Do you know when Hounsfield Units units were resolved

16:19:42 5 or published about?

16:19:47 6 A. It was mentioned yesterday and shows how old I am

16:19:50 7 that I don't even remember the date.

16:19:52 8 Q. So prior to yesterday, you weren't -- you didn't have

16:19:55 9 the knowledge of the history of when Hounsfield Units were

16:19:58 10 first written about?

16:20:01 11 A. So, I did research on Hounsfield Units, I did

16:20:05 12 research. At some point I knew exactly what those dates

16:20:08 13 were, just that it doesn't make sense for me to commit it to

16:20:11 14 memory. I know generally of the process, I know generally

16:20:14 15 that they're old, I'm not going to commit the dates to

16:20:17 16 memory.

16:20:19 17 Q. I understand. Is it safe to say it was decades ago?

16:20:22 18 A. It's a long time ago, yeah, decades ago.

16:20:25 19 Q. Same with the Feldkamp Algorithm, that's been known

16:20:28 20 for decades going back to the '80's, right?

16:20:31 21 A. That sounds accurate to me.

16:20:34 22 Q. Now, you agree that densitometry was known in the art

16:20:37 23 before 1999; correct?

16:20:40 24 A. Yes, densitometry in general, measuring the bone

16:20:43 25 density, yes.

16:20:47 1 Q. And you agree that Dr. Massie did not invent
16:20:50 2 densitometry, correct?

16:20:51 3 A. As defined earlier, by the general measures of bone
16:20:58 4 density, it's wide area, so the general concept, no, he did
16:21:03 5 not.

16:21:03 6 Q. And densitometry to determine bone density was used
16:21:07 7 in medical applications before 1999; correct?

16:21:12 8 A. In various aspects of medicine, yes, some sort of
16:21:18 9 densitometry, various aspects at least I do know about that
16:21:21 10 was used in medicine, yes.

16:21:23 11 Q. Did that include orthopedic applications?

16:21:27 12 A. Among others, yes, orthopedic applications.

16:21:29 13 Q. And that would be, for example, to detect bone decay
16:21:32 14 or bone loss, correct?

16:21:34 15 A. Well, more like the general health of your bone
16:21:43 16 structure, if you have enough calcium, if you're going to
16:21:49 17 have an early break of the hip maybe, or if you're going to
16:21:52 18 break the bone early, I don't know how to answer that
16:21:55 19 question for you. It seems like you're wanting to specify
16:22:00 20 to a certain point and generally I can't answer that with
16:22:03 21 that specificity.

16:22:06 22 Q. Cone beam computed tomography was known before
16:22:11 23 Dr. Massie's patent; correct?

16:22:13 24 A. Yes, the cone beam CT technique was known.

16:22:15 25 Q. Now, you showed the jury a number of screen shots

16:22:24 1 from the Romexis software that Planmeca develops, right?

16:22:30 2 A. A few, I wish I could have shown more.

16:22:34 3 Q. Were you not able to show more?

16:22:37 4 A. I was limited to the screen shots.

16:22:41 5 Q. Okay. I understand.

16:22:41 6 Now, there are no screen shots of models or
16:22:45 7 images in the Osseo patents, correct?

16:22:53 8 A. I don't understand your question.

16:22:54 9 Q. Well you showed the jury a number of screen shots
16:22:58 10 about implant procedures, 3D renderings that you get with
16:23:01 11 the Romexis software. What I'm asking is, in the patent,
16:23:11 12 the three patents that are at issue here, there is no
16:23:14 13 pictures of any screen shots or what an image would look
16:23:17 14 like from the system that Dr. Massie allegedly invented
16:23:21 15 right?

16:23:21 16 A. Now I understand thank you. There are images on how
16:23:25 17 the placement of sensors and sources are, those are not, I
16:23:30 18 believe they are not images you are talking about. But the
16:23:34 19 3D model images that I believe you're referring to, they
16:23:38 20 were not. And at the time I don't believe there were any
16:23:42 21 systems that can generate those type of screen shots that
16:23:46 22 would demonstrate what that is.

16:23:48 23 Q. So is the answer to my question no, Dr. Kia that
16:23:51 24 there are no screen shots of the output images that would be
16:23:55 25 produced by Dr. Massie's alleged invention?

16:23:58 1 A. Did you just say screen shots, there would be no
16:24:01 2 screen shots.

16:24:02 3 Q. Okay. Thank you.

16:24:03 4 Now, the word densitometry does not appear in
16:24:07 5 the claims of the '374 patent; correct?

16:24:11 6 A. In the claims of the '374, at least the two that I
16:24:16 7 went over, yes.

16:24:17 8 Q. And you have not provided any opinion on why
16:24:21 9 densitometry was taken out of the claims of the '374 patent;
16:24:24 10 correct?

16:24:27 11 A. I did not provide any opinion why there is or isn't
16:24:30 12 densitometry, I just looked at the claims as they are.

16:24:33 13 Q. And you don't know whose decision it was to remove
16:24:36 14 densitometry from the claims of the '374 patent; correct?

16:24:38 15 A. That's correct, I do not have an opinion on that.

16:24:42 16 Q. But the Court, as looked at what Dr. Massie,
16:24:45 17 effectively inserted densitometry into the claims of the
16:24:48 18 '374 patent by its claim construction order, correct?

16:24:51 19 A. I don't know how to answer that question specifically
16:24:54 20 when you asked inserted. I don't know the thought process
16:25:00 21 that went through that from the court ruling.

16:25:02 22 Q. You don't know the Court's thought process on how it
16:25:05 23 came to its ruling?

16:25:10 24 A. Well, I don't know what the arguments or how it was
16:25:13 25 convinced, what -- I mean, not inside the head of anyone who

Kia - cross

16:25:18 1 tries to figure out why it was inserted or not, I just take
16:25:22 2 the ruling as it is.

16:25:26 3 Q. Mr. Herndon, can we put up Dr. Kia's demonstrative, I
16:25:40 4 believe it's PDX 2.21.

16:25:51 5 Now the second to the last bullet here says you
16:25:54 6 considered claim construction briefs and the Court's claim
16:25:57 7 construction order. Right?

16:25:58 8 A. Yes, sir, I did.

16:25:59 9 Q. And that is the extent of the claim construction
16:26:01 10 materials you considered in this case?

16:26:03 11 A. I reviewed documents regarding claim construction,
16:26:15 12 which was the briefs and the order. I looked at the
16:26:20 13 arguments that are presented in the briefs and I took the
16:26:23 14 order of what the meanings of those terms are, I didn't try
16:26:28 15 to understand how or why decisions were made to come to that
16:26:34 16 order, I just took it as they were.

16:26:41 17 THE COURT: And that's what we're all doing.
16:26:47 18 We're not doing claim construction.

16:26:50 19 Q. I understand.

16:26:51 20 You agree that tomography modeling is limited to
16:26:54 21 densitometry in this case, right?

16:26:56 22 A. That's correct.

16:26:58 23 Q. Are you aware that this Court issued a claim
16:26:59 24 construction opinion?

16:27:00 25 A. I believe part of that order was opinion, yes.

16:27:06 1 Q. Now, if you had your reports still in front of you,
16:27:15 2 the May 30th, 2019, report, if you go -- you can take that
16:27:19 3 down.

16:27:19 4 If you go to appendix 1?

16:27:23 5 A. I'm sorry, I'm trying to make sure this is the right
16:27:27 6 report you're talking about.

16:27:28 7 Q. Sure.

16:27:30 8 A. Is this my first report on infringement?

16:27:33 9 Q. Yes.

16:27:34 10 A. Okay, I'm there.

16:27:35 11 Q. And this is the list of documents and things you
16:27:38 12 considered in forming your opinions?

16:27:39 13 A. What is this.

16:27:41 14 Q. Appendix 1?

16:27:48 15 A. Appendix 1. It's appendix 1, tab --

16:27:51 16 Q. Yes. This was appendix 1 to your May 30, 2019,
16:27:54 17 report.

16:27:54 18 A. Yes.

16:27:57 19 Q. Okay. And so this is a list, the jury can't see
16:28:00 20 this, but talk through it, this is a list of the documents
16:28:03 21 and things you considered, correct?

16:28:05 22 A. This is a list of what I considered, the best I knew
16:28:11 23 how to document it at the time.

16:28:15 24 Q. Okay. And I see here that you have the Court's claim
16:28:19 25 construction order at docket 46, correct?

16:28:21 1 A. That's correct.

16:28:22 2 Q. Docket 44 is not listed here, is it?

16:28:25 3 A. No, I don't know even how to look for that. What are
16:28:29 4 you saying?

16:28:30 5 Q. Docket 44 is the Court's claim construction opinion.
16:28:33 6 I'm wondering if you considered that in understanding how
16:28:38 7 the Court reached its order?

16:28:40 8 A. So you refer to docket, I see DI 33 and DI 42, I
16:28:46 9 don't even know if those represent dockets. Those are the
16:28:49 10 acronyms I used. You mentioned docket 44, I don't know what
16:28:54 11 that means.

16:28:54 12 Q. Do you agree that all the asserted patent claims in
16:28:57 13 this trial require densitometry as the term has been
16:29:00 14 construed by the Court?

16:29:02 15 A. All of the tomography models that we have been
16:29:08 16 through, all of them, there are various, the various names
16:29:14 17 all refer to tomography models, include densitometry, we
16:29:18 18 went through all of that.

16:29:19 19 Q. The limitation of densitometry is either expressly in
16:29:23 20 the claim or it's in the claim due to the Court's claim
16:29:26 21 construction order, correct?

16:29:27 22 A. That's correct.

16:29:28 23 Q. And the court has construed densitometry to mean
16:29:32 24 quantitatively calculated bone density, correct?

16:29:34 25 A. Yes, sir. That's correct.

16:29:35 1 Q. Would a qualitative measurement of bone density meet
16:29:39 2 the Court's construction of densitometry?

16:29:43 3 A. Well, there is two parts, one is what do you mean by
16:29:49 4 qualitative? What constitutes qualitative? And if it can
16:29:54 5 be separated from quantitative, yes, that would be
16:29:58 6 different.

16:29:58 7 Q. The word qualitative does not appear in the Court's
16:30:01 8 claim construction; correct?

16:30:02 9 A. Well, I have no review the claim construction, but
16:30:04 10 sitting here and now, I don't recall seeing it.

16:30:11 11 Q. But the Court's claim construction is quantitatively
16:30:14 12 calculated bone density, correct?

16:30:14 13 A. That's correct.

16:30:14 14 Q. That is the full construction of the term
16:30:15 15 densitometry, right?

16:30:20 16 A. That's correct.

16:30:20 17 Q. And the word qualitative is not in the Court's
16:30:21 18 construction of densitometry, correct?

16:30:25 19 A. That's correct.

16:30:26 20 Q. And the word relative or the phrase relative density
16:30:27 21 is not in the Court's claim construction of densitometry;
16:30:30 22 correct?

16:30:32 23 A. I believe there was some relative language in there,
16:30:33 24 if I take a look at it, maybe I can help out.

16:30:42 25 Q. The Court's construction is quantitatively calculated

16:30:45 1 bone density, do we agree that?

16:30:47 2 A. For densitometry.

16:30:48 3 Q. For densitometry, yes, we're talking just about the
16:30:51 4 term densitometry. That construction does not use the word
16:30:54 5 relative, correct?

16:30:58 6 A. That construction does not, that's correct.

16:31:02 7 Q. Now, the term Hounsfield Units doesn't appear in any
16:31:08 8 of the asserted claims or any of the patents; correct?

16:31:12 9 A. I believe I was asked earlier, and that is my
16:31:18 10 recollection, it does not.

16:31:21 11 Q. And the term grayscale doesn't appear in any of the
16:31:23 12 claims, correct?

16:31:24 13 A. From my memory, yes, it does not.

16:31:26 14 Q. Now, you agree that Hounsfield Units are not absolute
16:31:29 15 measures of material density?

16:31:42 16 A. Well, I don't know how to answer that question. It's
16:31:47 17 primarily because of the qualifier "absolute", you have to
16:31:53 18 clarify that for me.

16:32:01 19 Q. Turning to your deposition which is the first
16:32:04 20 document in the binder.

16:32:17 21 A. The first document in my binder --

16:32:20 22 Q. I'm sorry, Tab 4.

16:32:25 23 A. Okay.

16:32:26 24 Q. And if you would go to page 82, line 17. Let me know
16:32:32 25 when you're there?

16:32:38 1 A. I'm there.

16:32:39 2 Q. And you were asked, "Do you agree that Hounsfield
16:32:44 3 Units are not absolute measures of material density?"

16:32:46 4 And your answer was, "Yes."

16:32:49 5 Did I read that correctly?

16:32:50 6 A. That's correct.

16:32:52 7 THE COURT: Find a place to square up now
16:32:54 8 because it's past 4:30.

16:32:56 9 MR. QURESHI: This would be a good time because
16:32:58 10 I'm about to go into a different module.

16:33:00 11 THE COURT: Ladies and gentlemen of the jury,
16:33:02 12 we're going to to break for the day. I'll remind you of my
16:33:05 13 previous admonitions, that is to keep your own counsel,
16:33:08 14 don't talk to anybody about this, don't do any independent
16:33:12 15 research and keep an open mind about what the results should
16:33:15 16 be until you have heard all the evidence and we're not quite
16:33:18 17 there yet, I don't think, so we'll see you tomorrow morning
16:33:21 18 at 9 o'clock. We're in recess.

16:33:24 19 COURT CLERK: All rise.

16:33:27 20 (Jury leaving the courtroom at 4:33 p.m.)

16:33:42 21 THE COURT: All right you can step down, Doctor.
16:33:50 22 We'll see you tomorrow morning at 9 o'clock for the jury.
16:33:54 23 I'll be here at 8:30 in case we have issues. Do we have any
16:33:57 24 issues now before we break for the day?

16:33:59 25 MR. QURESHI: My team says no on our side.

16:34:01 1 THE COURT: Okay. All right.

16:34:03 2 MR. OSTROW: No, Your Honor.

16:34:05 3 THE COURT: So the only thing I'm concerned
16:34:07 4 about right now in this line ever questioning is that you
16:34:09 5 seem to make a differentiation between the patent and the
16:34:13 6 Court's claim construction. And the jury has to follow the
16:34:18 7 Court's claim construction. So that's effectively what the
16:34:22 8 patent says with that claim construction. So I'm -- I don't
16:34:27 9 want the jury to think that they have the option to do
16:34:30 10 something other than the Court's claim construction or that
16:34:34 11 the Court's claim construction somehow is inconsistent with
16:34:36 12 the language of the patent by the patentee.

16:34:42 13 MR. QURESHI: It is actually the opposite, Your
16:34:44 14 Honor.

16:34:44 15 THE COURT: Okay. But you keep making that
16:34:47 16 differentiation, so that's what I am concerned about.

16:34:50 17 MR. QURESHI: Okay. I'll make sure to be clear,
16:34:52 18 Your Honor.

16:34:53 19 THE COURT: Well, you're clear, I don't want the
16:34:55 20 jury to believe that the Court's claim construction somehow
16:35:00 21 or another was contrived or that they have the option of
16:35:02 22 looking at the patent and saying well, the Court's claim
16:35:04 23 construction wasn't what it was supposed to be.

16:35:12 24 MR. QURESHI: I see. My line of questioning,
16:35:14 25 I'm actually trying to do the opposite is to make it clear

16:35:16 1 to the jury that the Court's construction is what controls
16:35:19 2 the definition of densitometry.

16:35:22 3 THE COURT: All right. Anything further, ladies
16:35:24 4 and gentlemen? All right. We'll see you tomorrow at 8:30.
16:35:29 5 9 o'clock for sure. We're in recess.

16:35:32 6 COURT CLERK: All rise.

16:35:33 7 (Court adjourned at 4:35 p.m.)

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